60TH CONGRESS
2d Session

HOUSE OF REPRESENTATIVES

DOCUMENT
No. 1220

INVESTIGATIONS

AS TO

PNEUMATIC-TUBE SERVICE FOR THE MAILS

LETTER FROM

THE POSTMASTER-GENERAL

SUBMITTING THE REPORT OF AN INVESTIGATION AS TO PNEUMATIC-TUBE SERVICE FOR THE MAILS

DECEMBER 15, 1908.—Referred to the Committee on the Post-Office and Post-Roads and ordered to be printed with illustrations.

WASHINGTON
GOVERNMENT PRINTING OFFICE
1909

60TH CONGRESS, 2d Session } HOUSE OF REPRESENTATIVES { DOCUMENT No. 1220

INVESTIGATIONS

AS TO

PNEUMATIC-TUBE SERVICE FOR THE MAILS

LETTER FROM

THE POSTMASTER-GENERAL

SUBMITTING THE REPORT OF AN INVESTIGATION AS TO PNEUMATIC-TUBE SERVICE FOR THE MAILS

DECEMBER 15, 1908.—Referred to the Committee on the Post-Office and Post-Roads and ordered to be printed with illustrations.

WASHINGTON
GOVERNMENT PRINTING OFFICE
1909

TABLE OF CONTENTS.

APPENDIX.

POST-OFFICE DEPARTMENT,
OFFICE OF THE POSTMASTER-GENERAL,
Washington, D. C., December 15, 1908.

SIR: In compliance with the authorization and direction of the provision of the act of May 27, 1908, making appropriations for the service of the Post-Office Department for the fiscal year ending June 30, 1909 (30 Stat. L., chap. 206, p. 412), to investigate and report to Congress not later than January 1, 1909, the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube service, and thereafter operating the same in the cities where such service is now in operation, and also ascertain and report the approximate cost of purchase and likewise of installation and the cost of maintenance and operation, I have the honor to submit herewith, for the information of the Congress, a report of the results of the investigation, the conclusions of which I approve.

Very respectfully,

G. v. L. MEYER,
Postmaster-General.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

POST-OFFICE DEPARTMENT,
Washington, D. C., December 10, 1908.

The POSTMASTER-GENERAL.

SIR: The undersigned, constituting a commission appointed by your order No. 1495, of June 19, 1908, to investigate and advise you as to the feasibility and desirability of the Government purchasing or installing equipment for pneumatic-tube service and thereafter operating the same in the cities where such service is now in operation, etc., have performed the duties as set forth in your order, and beg to respectfully submit the following report:

The commission held a meeting at Washington on September 14 for the purpose of organization and laying out a programme of action. At this meeting it was decided, after careful consideration, to appoint a subcommittee to investigate and procure the necessary data relating to the pneumatic-tube service. This subcommittee consisted of Joseph Stewart, superintendent of the division of railway adjustments; V. J. Bradley, superintendent of Railway Mail Service; E. M. Norris, assistant superintendent of the division of salaries and allowances; and J. M. Masten, assistant superintendent of Railway Mail Service. This subcommittee has prosecuted its labors thoroughly and as speedily as the circumstances would permit, and their report, which is forwarded herewith, is believed to be a complete and thorough exposition of all phases of the subject necessary for an understanding of the relation of pneumatic-tube service to other classes of mail transportation and for the determination of the questions which you have referred to this commission for advice and recommendation.

Their report is necessarily lengthy because of the importance of the subject and because of the many details which had to be considered and estimated, and from its nature it is difficult to do it justice in a brief summary of the essential parts; but the following résumé will at least be helpful for a ready, if not a complete, understanding of the material presented.

SUMMARY.

1. BRIEF HISTORY.

The use of pneumatic tubes in the United States mail service commenced experimentally in 1893 with about one-half mile of service in Philadelphia, and continued unchanged until 1898, when about 8 miles of service went into operation in Philadelphia, Boston, and New York. By 1905 this had grown to about 26 miles, Chicago and St. Louis being added to the cities first mentioned.

On July 1, 1908, there were 31 miles in operation in the five cities. Since July 1 an extension has been made in Brooklyn and several extensions have been made in New York city, making the total mileage on November 10 about 42½ miles. At the present time there is under contract new service representing about 22 miles additional, thus making a total, present and prospective, of about 64½ miles. The annual outlay for the 42½ miles in operation is about $724,000. The total prospective outlay for the 64½ miles will be about $1,089,000.

2. FOREIGN COUNTRIES.

The pneumatic-tube service abroad was established primarily in connection with the telegraph systems in the various cities of Great Britain, France, Germany, and Austria, but it appears also to be used for the transmission of special-delivery letters in Paris, Berlin, and Vienna. These tubes are 3 inches or less in diameter. There seems to be no country outside of the United States which uses tubes for the transmission of first-class mail generally.

3. IMPORTANCE OF AMERICAN CITIES IN WHICH PNEUMATIC-TUBE SERVICE IS NOW PROVIDED.

It is shown that the combined postal revenues collected during the fiscal year ended June 30, 1908, at the six post-offices in Boston, New York, Brooklyn, Philadelphia, Chicago, and St. Louis was nearly $51,000,000, this being about 27 per cent of the entire postal receipts of the country. The first-class mail originating in these cities is about 27 per cent of the first-class mail originating in the United States, amounting to about 8,000,000 pieces daily. The special-delivery matter delivered at these offices last year was over 4,000,000 pieces, this being about 30 per cent of all such matter delivered in the entire country. The first-class mail of local origin for local delivery—a very profitable class of matter—amounted to 2,629,000 pieces daily, this being about 31½ per cent of the total first-class mail of these cities. The subcommittee estimates a profit to the postal service of about $9,000,000 per annum from this mail alone.

4. PROPORTION OF THE FIRST-CLASS MAIL TRANSMITTED BY TUBE.

This was, in the cities mentioned, about 46 per cent of all first-class mail dispatched and about 43½ per cent of all first-class mail received. Out of a total of nearly 16,000,000 pieces dispatched daily, 1,835,000 pieces, or about 11 per cent, is said to have been actually advanced in dispatch because of the tube service, and of about 14,000,000 pieces of first-class mail received daily at these offices, 787,000, or about 10.6 per cent, is said to have been actually advanced by tube service over other means. The average cost per piece actually advanced is computed to be less than one-tenth of a cent (six-tenths of 1 mill).

5. ADVANTAGES AND LIMITATIONS OF PNEUMATIC-TUBE SERVICE.

Speed.—In regard to the contract speed of 30 miles per hour between any two postal stations, it appears that this is maintained in practice, but it is pointed out that between far-distant points on long sections there is a possibility of losing much of this advantage because of the necessity of rehandling the tube carriers at intermediate stations. The extreme reduction of speed in any one instance was from 30 to about 15 miles per hour.

Frequency and capacity.—As regards frequency and capacity, it appears that the frequency of dispatches by tube carriers for twenty hours of operation is about 4,800 times daily in one direction, this being far more frequent than the previous service by wagons or street cars. While this frequency is obtained for moderate quantities of mail, when heavy mails of sudden accumulation are ready for dispatch—say, 1,000 pounds, or 50,000 letters, per hour—the entire load can be moved more advantageously and economically by wagon or other means, while the pneumatic tube would be used for the supplemental dispatch which could not be accomplished by any other means.

Inadequacy.—There are reported several instances wherein the pneumatic-tube service is not capable of conveying the maximum quantities of first-class mail to or from railroad depots in connection with a few of the most important postal-car trains, and it is suggested that those cases could best be dealt with by wagons or automobiles, thus reserving the tube for supplementary mail.

Headway.—The closest interval between tube carriers originally expected to be six seconds is now thirteen to fifteen seconds, so that the total number of letters dispatched one way per hour is rated at 108,000 instead of, as in the early days, 360,000.

Other use of the tube.—Outside of the first-class mail, instances are reported where second, third, and fourth-class mail, and also registered matter, is dispatched between city postal stations, but the total quantity is extremely small in comparison with the amount of first-class mail transported.

Constant availability.—This feature of the tube service is commented upon very favorably, being an especially valuable factor in connection with special-delivery mail, and also local first-class mail for local delivery.

Standard of economical system.—The opinion is quoted of the chief mechanical expert on pneumatic-tube questions that the standard of mechanical efficiency is best represented by a tube 8 inches in diameter rather than by one of larger diameter, and that the speed

of 30 miles per hour represents the maximum speed of economical efficiency, and it is desirable to reduce this speed whenever it is not essential.

6. PERCENTAGE OF TUBE CAPACITY UTILIZED.

On account of the capacity of the tube being invariable, while the accumulation of mail is principally in the later hours of the business day, the full capacity is by no means employed. The maximum use appears in New York City, where the heaviest section shows 66.6 per cent daily, while the smallest use is shown on one section in Boston, 2.2 per cent, and one section in Philadelphia, 2.75 per cent. Upon the total mileage covered in the report (36 miles) over 10 per cent of the tube capacity is used daily on about 20 miles, and less than 10 per cent on 16 miles.

Hours of operation.—The period of operation in all the cities is nineteen or twenty hours daily, with a few exceptions as to particular sections. On Sundays the period varies from five to twelve hours.

Economies effected.—In connection with the present expenditure of about $724,000 per annum for the tube service, it is pointed out that there have resulted economies by a discontinuance or reduction of other transportation services to an amount estimated at about $97,000 per annum.

7. COMMENTS OF POSTMASTERS IN REFERENCE TO THE GENERAL DESIRABILITY OF THE PNEUMATIC-TUBE SERVICE.

These are quoted at length in the subcommittee's report.

8. TUBE-SERVICE CONTRACTS.

While there is a separate incorporated company in each of the cities which contracts with the Post-Office Department for the performance of pneumatic-tube service, there are, in fact, only two companies in control of the contracting companies, viz, the American Pneumatic Service Company, of Boston, which is the parent company for those operating in Boston, New York, Brooklyn, Chicago, and St. Louis, and the Pneumatic Transit Company as regards Philadelphia. These two companies operate jointly under the patents of the American Pneumatic Service Company and of the Batcheller Pneumatic Tube Company, under a partition of territory.

The existing contracts for pneumatic-tube service will not expire until June 30, 1916.

9. A DESCRIPTION OF PNEUMATIC-TUBE SYSTEMS.

A mechanical description is given detailing the method of operation and the different machinery employed.

10. UNNECESSARY VARIETY OF MACHINERY IN USE.

It is pointed out that while there should be but one standard form of receiver and of transmitter, there are found at present 10 different types of receivers, 7 different types of transmitters, and 9 different types of compressing machinery, besides several varieties of motive-power engines, those being also partly electric and partly steam.

This criticism has very little application to Philadelphia, where the machinery is almost entirely uniform in style and character.

Tube carriers.—It appears that an acceptable standard of carrier has yet to be developed, and it is pointed out that the unavoidable violence to the carriers when in use causes a very heavy item of expense in operation, ranging from $14 to $20 per annum per carrier, although the original cost of an 8-inch carrier is $20.

11. APPROXIMATE COST OF PURCHASE.

The report shows that the companies are willing to sell their property to the Government. The American Pneumatic Service Company has offered to have the price fixed by agreement with the Government, or, failing in that, by arbitration. The total cost of the American Company's systems, rating at par the stock and bonds issued for construction or purchase, is given as $7,093,557.69, and in reply to a question as to the actual cost, the company says that from its books it appears to be $5,526,822.43. The Pneumatic Transit Company of Philadelphia states the total cost of its system, including some mileage yet to be finished, as $1,390,000, and in response to a question as to the actual cost, they give the amount as $601,730 for original construction. Combining the figures just quoted from both companies, the highest price fixed would be $8,483,557.69, of which $6,128,552.43 is stated by the companies as representing the actual cost to them of the original systems. The figures just given are for a total of 48.09 miles.

The American Pneumatic Service Company was requested to state in detail the cost of constructing their systems at the present time. In response they submitted an estimate from their chief engineer as to the cost of reproducing their systems. The estimate was on the basis of 39.88 miles, and totaled $2,966,534.18 The subcommittee made an independent estimate, after consulting with contractors and manufacturers, and on the basis of 37.04 miles reached the conclusion that the cost of construction at the present time would be $2,486.536. The subcommittee's estimate shows an average of $67,131 per mile, as compared with the estimate of the company's engineer of $74,367 per mile. The subcommittee estimated for the Philadelphia system, on a basis of 6.02 miles, that it would cost to construct at the present time $389,174 ($64,647 per mile), in comparison with the Pneumatic Transit Company's statement of actual cost, already quoted, of $601,730 ($73,292 per mile).

Combining these figures, we find the following results:

Maximum cost of purchase as stated by companies (48.09 miles)	$8,483,557.69
Actual cost as stated by companies (48.09 miles)	6,128,552.43
Subcommittee's estimate of cost of construction (43.06 miles)	2,875,710.00

12. COST OF MAINTENANCE AND OPERATION.

The annual cost of operation as stated by the companies ranges from $13,375 in Philadelphia to $15,610 in New York, but these figures do not include allowance for taxes and interest, and there is no allowance in New York for depreciation.

The subcommittee estimates that the annual cost of operation under government ownership, including the cost of future depreciation and conditioned upon the companies first making good the accrued depre-

ciation, would range from $12,879 in Chicago to $15,951 per annum in New York. In these amounts, however, the subcommittee explains that it has not included any annual interest charge on the cost of installation as computed by them, which sum would represent the Government's investment if the purchase were made at that price.

If the purchase were made at the higher prices, i. e., at either of the amounts mentioned by the companies, an interest charge of 3 per cent is included, in order that the surplus, which does not represent the actual value of any physical property, should be accounted for in some way in the presentation of the question.

13. RELATIONS WITH MUNICIPALITIES.

Circumstances prevented this subject from being exhaustively considered, but there would seem to be no serious obstacle or difficulty to prevent harmonious cooperation between the General Government and the municipalities if the Government sought to operate directly the pneumatic tubes in the cities where they are now operated.

14. TUNNELS AND SUBWAYS.

It is possible that in the future construction of passenger subways and tunnels in cities it may be feasible to lay pneumatic tubes more cheaply than heretofore, but the present outlook presents no immediate opportunity of material economy in this direction.

CONCLUSIONS.

The conclusions reached by the commission are as follows:

1. The pneumatic-tube service is a very important auxiliary for the rapid transportation of first-class mail in the most important cities, and performs a function not at present obtainable by other means.

2. Its constant availability makes it particularly appropriate for special-delivery mail; for all first-class mail of local origin for local delivery; for supplementary closings of first-class mail for dispatch by train; and for advance dispatches of first-class mail from trains for city delivery.

3. When established, it should also be employed, as far as possible and economically, for the transportation of other mail.

4. Registered mail should be sent by tube whenever security and celerity can be combined in practice.

5. Mechanically, the tube service appears to be still in an experimental condition, although considerable progress has been made toward the development of a fixed standard of machinery.

6. With the above reservation the regularity and efficiency of the tube service is commendable.

7. As the present contracts call for the installation of 64½ miles of tube lines and as only 42½ miles are at present in operation, the tube companies should be required to complete their contracts without undue delay, in order that the effect of full and complete systems toward increasing the special-delivery and other first-class mail may be ascertained by the department from actual experience.

8. The present contracts under which the tube companies are performing mail service will not expire until June 30, 1916—almost eight years hence. During that period there should be ample opportunity for the companies to perfect the systems and for the Post-

Office Department to observe the effect upon the postal service. Further, during that period it is possible that other methods of transportation will be developed or improved so as to change entirely the outlook as it now appears. Five or six years hence, we believe, it will be advisable to renew the consideration of the question of government ownership.

9. In view of the foregoing, we consider it appropriate to advise you that, in our opinion, it is not feasible and desirable at the present time for the Government to purchase, to install, or to operate the pneumatic tubes, and this is our unanimous judgment.

PNEUMATIC TUBE COMMISSION:

DANIEL A. CAMPBELL,
Postmaster, Chicago, Ill.

GEORGE H. ROBERTS,
Postmaster, Brooklyn, N. Y.

E. C. MANSFIELD,
Postmaster, Boston, Mass.

FRANK WYMAN,
Postmaster, St. Louis, Mo.

JOSEPH STEWART,
Second Assistant Postmaster-General.

V. J. BRADLEY,
Superintendent Railway Mail Service.

E. M. NORRIS,
Assistant Superintendent Division of Salaries and Allowances.

J. M. MASTEN,
Assistant Superintendent Railway Mail Service.

REPORT OF SUBCOMMITTEE.

POST-OFFICE DEPARTMENT,
Washington, December 8, 1908.

The PNEUMATIC TUBE COMMISSION,
Washington, D. C.

GENTLEMEN: The subcommittee designated by your commission at the first meeting of September 14, 1908, to investigate and procure all necessary data relating to the pneumatic-tube mail service has completed its labors and submits the following report:

INTRODUCTORY.

The Postmaster-General's Order No. 1495, of June 19, reads as follows:

Ordered, That Daniel A. Campbell, postmaster of Chicago, Ill.; E. C. Mansfield, postmaster of Boston, Mass.; George H. Roberts, postmaster of Brooklyn, N. Y.; Frank Wyman, postmaster of St. Louis, Mo.; Joseph Stewart, Superintendent Division of Railway Adjustments;[a] V. J. Bradley, Superintendent Railway Mail Service; E. M. Norris, Assistant Superintendent Division of Salaries and Allowances; J. M. Masten, Assistant Superintendent Railway Mail Service; and Alfred Brooks Fry, chief engineer and superintendent of repairs, United States public buildings, New York, N. Y., be, and are hereby, appointed a commission of experts to investigate and advise the Postmaster-General as to the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube service and thereafter operating the same in the cities where such service is now in operation, and also ascertain and report the approximate cost of purchase and likewise of installation and the cost of maintenance and operation, in order that the Postmaster-General may report to Congress not later than January 1, 1909, as provided by the act of Congress approved May 27, 1908; and that the actual and necessary expenses of Post-Office Department and postal officials in connection therewith be paid.

The order substantially repeats the provision of law contained in the post-office appropriation bill approved May 27, 1908, reading as follows:

And the Postmaster-General is hereby authorized and directed to investigate and report to Congress not later than January first, nineteen hundred and nine, the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube service, and thereafter operating the same in the cities where such service is now in operation, and also ascertain and report the approximate cost of purchase and likewise of installation and the cost of maintenance and operation.

The subcommittee found it necessary to devote about two months' time to the work of investigation. This included an actual inspection of the pneumatic-tube system in each of the cities, and discussion with postal officials in each of these cities as to the work performed, and the comparative efficiency of the tube service, and explanation of the statistical reports that were desired. In addition to this, inter-

[a] Afterward became Second Assistant Postmaster-General.

views were had with contractors to obtain, if possible, estimates regarding the cost of excavation, laying pipes, and of construction work similar to that involved in installing pneumatic tubes. Interviews were also had with the officials of the tube-operating companies under contract with the department and with any others who appeared to be able to give information of value. Conferences were also had, partly by personal interview and partly by correspondence, with municipal authorities in order to secure an expression of opinion as to the relations which would exist between the United States Post-Office Department and the several cities in the possible event of government ownership and operation of the pneumatic-tube systems.

A great deal of data pertinent to the subject was thus collected, and all that is believed to be of value for a proper understanding of the case is submitted in this report, either as original documents or in tabulated form to permit of easy reference and comparison.

BRIEF HISTORY OF PNEUMATIC-TUBE MAIL SERVICE, 1892–1908.

The use of pneumatic tubes in the United States for the general transmission of first-class mail is believed to be unique, and it is therefore interesting, as well as valuable, to trace briefly the development of the system.

In foreign countries pneumatic tubes of small diameters (say 2½ to 3 inches) had been used for the transmission of telegrams, and in some instances for the transmission of special-delivery letters or cards. In the United States there were also some instances in commercial business of pneumatic tubes of similar dimensions for like purposes and for comparatively short distances. The first installation of a large tube for postal purposes was made in 1893 in Philadelphia, Pa., this being a 6-inch tube, and it is said that the problems connected with its operation were entirely different from those solved in the use of the tubes of smaller diameter. This 6-inch tube was in operation for about four years before the installation of 8-inch tubes was commenced. There has been a constant employment of inventive ingenuity during the past fifteen years to improve the mechanical operation of these larger systems. The chronology of the pneumatic-tube mail service is briefly given as follows:

1892.—Annual Report of Postmaster-General Wanamaker announces that he was able to secure an item of $10,000 in the last appropriation bill for experiments with pneumatic tubes, and that in response to advertisements eight proposals were submitted, of which, however, only one proved practicable for immediate testing. The Pneumatic Transit Company of New Jersey is already putting down tubes in Philadelphia between the general post-office and the East Chestnut Street Postal Station, to be completed soon after December 1, 1892. He is informed that the company is at an expense of $25,000, and the Post-Office Department can try the system for one year without expense, and may then rent, purchase, or reject it without incurring any liability.

1893.—*March 1.*—Use of Philadelphia 6-inch tube, as above described, commenced this date for the transmission of mail experimentally.

1894.—*March 1.*—Commencing this date Post-Office Department pays for the use of the Philadelphia tube, the terminus of which has

been removed from the East Chestnut Street Station to the Bourse Building. Total distance, 0.55 mile; annual pay $4,000. This was reduced, commencing March 1, 1895, to $3,450 per annum.

1895.—Annual Report of Second Assistant Postmaster-General intimates that arrangements may soon be feasible for an experimental tube or mechanical appliance between the New York general post-office and the Forty-second Street Depot and between New York and Brooklyn. He remarks that this will be very desirable on account of the heavy tonnage between the points named and the present expense of transporting the mails between these points.

1896.—Appropriation bill for fiscal year ended June 30, 1897, in the allowance for "Mail messenger service," provides that a sum not exceeding $35,000 may be used for the transportation of mails by pneumatic tubes or other similar devices.

Report of Second Assistant Postmaster-General states that 24-inch or 36-inch tubes are not practicable on account of construction difficulties and expense, but that a 10-inch tube with 8-inch carriers would relieve the department of 65 to 70 per cent of trips now made by wagons. He remarks that prospects seem favorable for early contracts in New York, Philadelphia, and Boston, and that it is possible that a proposition may be received from New York City for pneumatic-tube service over almost the entire island, in which event he would ask that Congress change the amount of money which is now paid for regulation wagon service in New York City to the pneumatic-tube fund, "as the establishment of the tube service would practically do away with wagon service in New York City." He recommends that $50,000 be appropriated to succeed the present appropriation of $35,000.

1897.—The appropriation bill for the year ended June 30, 1898, permits of the expenditure of $150,000 (out of mail-messenger fund) for transportation of mail by pneumatic tube or other similar device. In pursuance of this, contracts were made for service in Philadelphia, Brooklyn, New York, and Boston, all contracts contemplating 8-inch tubes, carriers to be $6\frac{3}{8}$ by 21 inches, to be dispatched at intervals of six seconds. The Second Assistant Postmaster-General estimates that each carrier will hold about 600 ordinary letters, making a capacity of 360,000 per hour each way.

October 15. New York, N. Y.—Tube service began this date, general post-office to Station P, 0.7 mile.

December 20. Boston, Mass.—Tube service began this date from general post-office to North Union Station, 0.74 mile.

1898.—*February 26. New York, N. Y.*—Tube service began this date, general post-office to Station P, 0.7 mile.

March 10. Philadelphia, Pa.—Contract made this date for renewal of service on 6-inch line, general post-office to Bourse Station, 0.52 mile, at $17,600 per annum.

April 7. Philadelphia, Pa.—General post-office to Broad Street Station tube service commenced this date, 0.94 mile, $16,966 per annum. Reading Terminal not yet connected.

August 1. Brooklyn, N. Y.—Tube service began this date between New York general post-office and Brooklyn general post-office, 1.65 miles.

Pneumatic-tube service in operation August 1, 1898.

City.	Termini.	Length.	Annual rate.	Rate per mile.
		Miles.		
Boston, Mass.	General post-office to North Union Station	0.74	[a] $17,055.00	$23,047
New York, N. Y.	New York general post-office to Brooklyn general post-office.	1.65	[b] 20,200.00	12,242
	General post-office to Station P	4.20	[c] 176,099.70	41,928
	General post-office to Stations D, Madison square and F to H.			
Philadelphia, Pa.	General post-office to Bourse Station	.52	[d] 17,965.00	34,548
	General post-office via Reading terminal to Broad Street Station.	.94	16,966.00	18,048
Total		8.05	248,285.70	30,842

[a] Includes steam power, $8,055.
[b] Includes labor, $6,200.
[c] Includes labor, $10,000; steam power, $15,044.70; and 2 engineers, $2,555.
[d] Includes steam power.

The post-office appropriation bill for the year ended June 30, 1899, prohibited any new contracts for pneumatic-tube service. (This prohibition continued until June 30, 1901.)

1899 to 1901.

Pneumatic-tube service in operation June 30, 1899, 1900, and 1901.

City.	Termini.	Length.	Annual rate.	Rate per mile.
		Miles.		
Boston, Mass.	General post-office to North Union Station	0.74	$9,000	$12,162
New York, N. Y.	New York general post-office to Brooklyn general post-office.	1.65	[a] 20,200	12,242
	General post-office to Station P	4.20	[b] 158,500	37,738
	General post-office to Stations D, Madison square and F to H.			
Philadelphia, Pa.	General post-office to Bourse Station	.52	17,600	33,846
	General post-office via Reading terminal to Broad Street Station.	.94	16,966	18,048
Total		8.05	222,266	27,610

[a] Includes $6,200 for labor. [b] Includes $10,000 for labor.

Congress omitted to make any appropriation for pneumatic-tube service for the fiscal year ended June 30, 1902, hence all of this service was discontinued and the tubes not operated from July 1, 1901, to June 30, 1902, inclusive. In lieu of an appropriation Congress directed an investigation by the Postmaster-General as to the cost of construction and operation and the utility of a system of pneumatic tubes, etc., to enable Congress to determine whether to own, lease, extend, or discontinue.

RECOMMENDATIONS BY COMMITTEE OF EXPERTS, 1901.

1901.—*January 4.*—Report this date by Postmaster-General to Congress, as directed, representing an investigation of the pneumatic-tube service by local postal officials, this result being revised by a general committee of postal officials, and this result finally passed upon by a commission of seven outside experts representing men of high commercial and engineering ability. The final committee of experts presented a number of positive conclusions, among which the following are the most important:

1. They found the new method of mail transportation to be a valuable and mechanically successful system, practically adapted in an admirable manner to the purposes of the Post-Office Department and of great advantage to the business interests of the country in facilitating mail transmission.

2. They believed that the cost of pneumatic service could be reduced somewhat, and very considerably reduced with the further progress of improvement.

3. They declared that ownership by the Government is considered desirable whenever the systems adopted have passed the experimental stage.

4. As regards renewing contracts or making new contracts they suggest that an option of later acquirement be included and that such acquirement be by appraisal by experts of all property and all patent rights applicable to the contract, or at a stated figure.

5. They advised the retention of all previously established pneumatic-tube service in Boston, New York (including the New York and Brooklyn line), and Philadelphia, 8.05 miles; and recommend the following additional mileage:

	Miles.
New York City	18.00
Chicago	8.78
Philadelphia	6.19
Boston	.70
St. Louis	3.16
Total	36.83

This making a grand total of both old and new service of about 44.88 miles.

LAW OF APRIL 21, 1902.

1902—*April 21.*—The post-office appropriation bill approved this date for the year ended June 30, 1903, contained the following provision:

For the transmission of mail by pneumatic tubes or other similar devices, five hundred thousand dollars, or so much thereof as may be necessary; and the Postmaster-General is hereby authorized to enter into contracts for a period not exceeding four years, after public advertisement once a week for a period of six consecutive weeks in not less than five newspapers, one of which shall be published in each city where the service is to be performed. That the contracts for this service shall be subject to the provisions of the postal laws and regulations relating to the letting of mail contracts, except as herein otherwise provided, and that no advertisement shall issue until after a careful investigation shall have been made as to the needs and practicability of such service and until a favorable report, in writing, shall have been submitted to the Postmaster-General by a commission of not less than three expert postal officials, to be named by him; nor shall such advertisement issue until in the judgment of the Postmaster-General the needs of the postal service are such as to justify the expenditure involved. Advertisements shall state in general terms only the requirements of the service and in form best calculated to invite competitive bidding.

That the Postmaster-General shall have the right to reject any and all bids; that no contract shall be awarded except to the lowest responsible bidder, tendering full and sufficient guaranties, to the satisfaction of the Postmaster-General, of his ability to perform satisfactory service, and such guaranties shall include an approval bond in double the amount of the bid.

That no contract shall be entered into in any city for the character of mail service herein provided which will create an aggregate annual rate of expenditure, including necessary power and labor to operate the tubes, and all other expenses of such service in excess of four percentum of the gross postal revenues of said city for the last preceding fiscal year.

That no contract shall be made in any city providing for three miles or more of double lines of tube, which shall involve an expenditure in excess of seventeen thousand dollars per mile per annum, and said compensation shall cover power, labor, and all operating expenses.

That the Postmaster-General shall not, prior to June thirtieth, nineteen hundred and four, enter into contracts under the provisions of this act involving an annual expenditure in the aggregate in excess of eight hundred thousand dollars; and thereafter only such contracts shall be made as may from time to time be provided for in the annual appropriation act for the postal service; and all provisions of law contrary to those herein contained are repealed.

Under this act contracts were made for service covering mileage of double lines of tubes in cities as follows:

	Miles.
Boston	5.44
New York	24.653
Philadelphia	7.642
Chicago	8.70
St. Louis	3.16
Total	49.595

1903.—During this fiscal year pneumatic-tube service was resumed in Boston, New York, and Philadelphia (8.05 miles), and extended so that on June 30, 1903, there was an aggregate in the three cities in operation of 12.495 miles.

1904.—Congress, in post-office appropriation bill approved March 3, 1903, appropriated "for transmission of mail by pneumatic tubes or other similar devices, $800,000."

RECOMMENDATIONS OF COMMITTEE OF 1905.

1905.—Congress, in post-office appropriation bill approved April 23, 1904, appropriated "for transmission of mail by pneumatic tubes or other similar devices $500,000, from which sum may be paid amount necessary to fulfill the existing contract for service in Boston."

Under date of October 4, 1905, a commission of three expert postal officials, appointed by Postmaster-General's order of November 15, 1904, to carefully investigate the needs and advisability of extending the pneumatic-tube service submitted its report with the following recommendations for additional mileage:

City.	In operation Oct. 1, 1905.	Additional recommended.	Total.
	Miles.	*Miles.*	*Miles.*
Baltimore, Md		2.06	2.06
Boston, Mass	6.89		6.89
Brooklyn, N. Y		3.94	3.94
Chicago, Ill	8.88	8.814	17.694
Cincinnati, Ohio		2.290	2.29
Kansas City, Mo		2.280	2.28
New York, N. Y	6.853	18.61	25.463
Philadelphia, Pa	1.382	6.242	7.624
Pittsburg, Pa		1.90	1.90
St. Louis, Mo	2.09	1.25	3.34
San Francisco, Cal		1.62	1.62
Total	26.095	49.006	75.101

1906.—Congress, in post-office appropriation bill approved March 3, 1905, for the fiscal year ended June 30, 1906, appropriated "for transmission of mail by pneumatic tubes or other similar devices, $500,000."

1907.—Congress, in post-office appropriation bill approved June 26, 1906, for the fiscal year ended June 30, 1907, appropriated "for the transmission of mail by pneumatic tubes or other similar devices, $900,000, and the Postmaster-General is hereby authorized to enter into contracts not exceeding in the aggregate $1,250,000 under the provisions of law, for a period not exceeding ten years; provided that said service shall not be extended in any cities other than those in which the service is now under contract under authority of Congress, except the Borough of Brooklyn of the city of New York, and the cities of Baltimore, Md.; Cincinnati, Ohio; Kansas City, Mo.; Pittsburg, Pa., and San Francisco, Cal."

1908.—Congress, in post-office appropriation bill approved March 2, 1907, appropriated "for the transmission of mail by pneumatic tubes or other similar devices, $1,250,000, and the Postmaster-General is hereby authorized to enter into contracts not exceeding in the aggregate $1,388,759 under the provisions of the law for a period not exceeding ten years; provided that said service shall not be extended in any cities other than those in which the service is now under contract under the authority of Congress, except the Borough of Brooklyn of the city of New York, and the cities of Baltimore, Md.; Cincinnati, Ohio; Kansas City, Mo.; Pittsburg, Pa., and San Francisco, **Cal.**

1909.—Congress, in the post-office appropriation bill approved May 27, 1908, for the fiscal year ended June 30, 1909, provides "for the transmission of mail by pneumatic tubes or other similar devices, $1,000,000; and the Postmaster-General is hereby authorized to enter into contracts not exceeeding in the aggregate $1,388,759 under the provisions of the law for a period not exceeding ten years."

The extent of pneumatic-tube service in operation on June 30 in each year from 1893 to 1908 is briefly set forth in the following table:

Growth of pneumatic-tube service, 1893–1908.

Fiscal year ending June 30—	Pneumatic-tube service in operation, etc., in—						Total length.	Total pay per annum.	Rate per mile.
	Philadelphia.	Boston.	New York.	Chicago.	St. Louis.	Brooklyn.			
	Miles.	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*		
1893	[a]						0.55		
1894	0.55						.55	$4,000	$7,272
1895	.55						.55	3,450	6,200
1896	.55						.55	3,450	6,200
1897	.55						.55	3,450	6,200
1898	1.46	0.74	5.85				8.05	232,085	28,830
1899	1.46	.74	5.85				8.05	222,266	27,610
1900	1.46	.74	5.85				8.05	222,266	27,610
1901	1.46	.74	5.85				8.05	222,266	27,610
1902	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1903	1.382	4.26	6.853				12.495	201,095	16,094
1904	1.382	6.89	6.853				15.125	218,470	14,444
1905	1.382	6.89	6.853	8.88	2.09		26.095	401,023	15,367
1906	4.002	6.89	6.853	8.88	2.09		28.715	445,563	15,516
1907	3.9	6.652	7	7.31	1.68		26.542	451,219	17,000
1908	6.022	6.652	9.3998	7.41	1.85		31.3338	532,679	17,000

1908 extensions:

	Miles.
Brooklyn, August 14, general post-office to Station L	1.35
New York—	
July 15, Station O to Station E	1.1704
September 21, Station E to Times square	1.1739
October 3, Times square to Station G	1.1719
November 6, Station G to Station N	1.4351
November 6, Station N to Station W	.9635
November 6, Station W to Station J	2.6174
November 6, Station J to Station L	.9522
November 9, general post-office to Hudson terminal	.4214

Totals for 1908: Length, 42.5896 miles; pay per annum, $724,023; rate per mile, $17,000.

[a] March 1, general post-office to East Chestnut Street Station (experimental).
[b] No appropriation; all service discontinued.

MILEAGE CONTRACTED FOR AND UNDER OPERATION NOVEMBER 10, 1908.

The appropriation for the current fiscal year is $1,000,000 and contracts are permitted for a total of $1,388,759. The service in operation November 10, 1908, represents an approximate annual rate of $724,028. The service contracted for represents an annual rate of about $1,089,171.09. The details are shown approximately in the following table:

City.	Contractor.	Total service contracted for.		Total service in operation November 10, 1908.		Yet to be built.
		Length.	Annual pay.	Length.	Annual pay.	
		Miles.		*Miles.*		*Miles.*
Boston	Boston Pneumatic Transit Co.	6.652	$113,089.14	6.652	$113,089.14	.....
New York	New York Pneumatic Service Co.	27.31	464,270.00	19.3056	328,195.20	8.0044
Brooklyn	do	1.35	22,950.00	1.35	22,950.00	.....
Philadelphia	Pneumatic Transit Co.	8.21	139,570.00	6.022	102,374.00	2.188
Chicago	Chicago Postal Pneumatic Tube Co.	17.563	294,470.80	7.41	125,970.00	10.153
St. Louis	St. Louis Pneumatic Tube Co.	3.47	54,821.15	1.85	31,450.00	1.62
Total	.....	64.555	1,089,171.09	42.5896	724,028.34	21.9654

Although Congress authorized contracts for tube service in Baltimore, Md.; Cincinnati, Ohio; Kansas City, Mo.; Pittsburg, Pa.; and San Francisco, Cal., no proposals were received by the department for service in those cities in response to the advertisement.

In the city of Philadelphia, although the mileage contracted for, as recognized by orders issued by the department, is 7.35, there is an additional extension between Southwark Station to Station D, 0.8637 mile, which, with the line between the general post-office and Southwark Station now in operation, make the total mileage contracted for 8.2137. In addition to this another extension has been recommended by a committee of three postal experts in July, 1908, from Station O via Fairhill Station to North Philadelphia Postal Station, a distance of about 1.72 miles; but contract has not been made for this last extension, the company not yet having agreed to it. This additional service, if contracted for, would raise the total mileage in Philadelphia to about 9.9337.

In the city of Chicago the mileage not yet built (10.153) includes the line out of use between the general post-office and Kinzie Station (1.77 miles).

PNEUMATIC-TUBE SERVICE IN FOREIGN COUNTRIES.

So far as can be ascertained there is no instance abroad of the use of pneumatic tubes for the transmission of general mail matter of the first class; in fact, the pneumatic-tube service was originally used merely as an adjunct to the telegraph service under government control and operation, but in some instances the use of the tubes has been extended to special-delivery letters or cards. In all of the instances hereafter described the pneumatic-tube systems are understood to be owned by the respective governments.

A summary of the information available is herewith presented:

Great Britain.—In Great Britain the tubes are about 3 inches in diameter and are used only as an adjunct to the telegraph system. It is understood that they are installed in several cities in England and also in Dublin, Ireland. Statistics of 1899 showed that in London alone there were about 38 miles.

France.—The tubes are of two types, 2.36 inches and 3.15 inches in diameter, and they are installed in the cities of Paris, Lyon, and Marseille. They are mainly an adjunct to the telegraph system, but are also used for the transmission of special-delivery letters and cards. In 1899 there were reported to be about 167 miles in use. In 1908 the mileage is reported as 217 miles, of which Paris has over 210 miles, Lyon, 2.73 miles, and Marseille, 3.89 miles.

Germany.—The tubes in use in Germany are about 2½ inches in diameter, and are reported to be in use in Berlin, Hamburg, and Frankfort on Main. They were originally installed as an adjunct to the telegraph system, but in the city of Berlin are also used for the transmission of special-delivery letters and cards. In 1899 it was reported that there were 73 miles in Berlin and 5¼ miles in Hamburg.

Recently it has been reported that the German postal administration has under consideration a proposed tunnel system for Berlin, to run between the principal post-office stations and the Potsdam depot. The proposed tunnel is planned to be 29 inches high by 71 inches wide. The design is to use a small car with capacity of carrying a single bag of mail and run at a speed of about 25 miles per hour. Several cars with an electric engine will form a train to be propelled on a railway track of 16.13-inch gauge within the tunnel. It is said that in Berlin the pneumatic-tube service for special-delivery letters has practically abolished urban telegrams. Telegrams cost the public about 1 cent a word, and unless sent "urgent" with treble toll are very little faster than a tube letter.

Italy.—There is not at present any pneumatic-tube service in Italy, but in September, 1908, official announcement was made that the Government was about to install pneumatic-tube service (3.6-inch diameter) in Naples, Milan, and Rome between the central post-offices and the railway stations in each city. The intention was to use the tubes for the transmission of telegrams and also special-delivery letters. The ordinary letter mail would, however, continue to be carried by horse-drawn wagons or automobiles.

Austria.—It is known that there is pneumatic-tube service in Vienna which is used in the transmission of telegrams and special-delivery letters, but statistics are not at hand as to its extent.

IMPORTANCE OF CITIES IN WHICH PNEUMATIC-TUBE SERVICE IS NOW PROVIDED.

The appropriation for pneumatic-tube service for the current fiscal year is less than one-half of 1 per cent of the total postal appropriation. Its expenditure is for service in six of the most important revenue-producing post-offices in the United States. These post-offices (Boston, New York, Brooklyn, Philadelphia, Chicago, and St. Louis) collected during the past fiscal year $50,723,364, this being 26½ per cent of the total postage receipts of the country. The first-

class mail (the most profitable class) originating at these six post-offices is about 27.7 per cent of all first-class mail originating in the United States. The number of pieces reported as received from the public daily is 8,344,093, although it is thought this total is 30 per cent higher than the average daily receipts throughout the year.

The special-delivery mail is also a profitable class of mail, and its volume would be greatly increased in certain cities by adequate tube service. At the six post-offices mentioned there were delivered last year 4,015,468 special-delivery letters, these representing nearly 30 per cent of all special-delivery matter in the entire country. The number of special-delivery letters delivered in the six cities in 1897 was 1,481,352, thus showing a growth of 177 per cent in eleven years. It is assumed that with a complete tube system in New York City south of One hundred and twenty-fifth street an immense increase in special-delivery letters could be confidently looked for in a short time.

The first-class mail of city origin for city delivery is reported by the post-offices in the six cities as 2,629,561 pieces daily, this being about 31½ per cent of their total first-class mail. This class of matter is not subject to general postal charges for handling and transportation, and is estimated to produce a profit of about $9,000,000 per annum. This class of mail would be especially benefited and increased by a complete system of pneumatic-tube service in certain cities.

The important postal statistics of the pneumatic-tube cities are shown in the following table:

Postal statistics [a] of cities in which pneumatic-tube service is provided.

Cities.	Population.[b]	Postage receipts for year ended June 30, 1908.	Clerks.	Carriers.	Collections daily.	Pieces first-class mail daily from—	
						Collections.	Drops.
Boston, Mass.	1,040,400	$5,352,176	1,480	1,230	7–20	655,079	508,778
New York, N. Y.	5,432,751	18,569,538	3,342	2,440	16–37	1,825,430	1,369,270
Brooklyn, N. Y.	1,622,000	2,397,553	490	1,022	7–11	335,972	86,127
Philadelphia, Pa.	1,835,872	5,922,602	1,115	1,187	10–18	880,795	408,279
Chicago, Ill.	2,500,000	14,599,083	3,112	1,469	10–27	1,376,464	426,081
St. Louis, Mo.	772,912	3,882,412	838	636	24	389,152	132,666
Total.	13,203,935	50,723,364	10,377	7,984	.....	5,412,892	2,931,201

Cities.	Deliveries daily.	Pieces first-class mail delivered daily.	Special-delivery mail during year ended June 30, 1908—		First-class mail dispatched daily.	
			Dispatched.	Delivered.	By tube.	By other means.
			Pieces.	*Pieces.*	*Pieces.*	*Pieces.*
Boston, Mass.	4–7	1,045,025	430,000	466,457	1,283,347	750,000
New York, N. Y.	6–9	3,114,311	1,513,303	1,465,285	2,317,570	5,137,823
Brooklyn, N. Y.	3–5	496,907	238,598	327,357	108,031	314,068
Philadelphia, Pa.	5–8	960,819	523,794	525,791	720,120	993,433
Chicago, Ill.	2–6	1,338,076	498,512	979,493	2,570,079	790,902
St. Louis, Mo.	4–6	474,583	163,500	251,085	461,836	541,838
Total.	.....	7,429,721	3,367,707	4,015,468	7,460,983	8,528,064

[a] Statistics, except as otherwise stated, are of October, 1908.
[b] Population in some cases is based on letter carriers' census and duplicates persons in business and residential districts.

Postal statistics of cities in which pneumatic-tube service is provided—Cont'd.

Cities.	Dispatched by tube; actually advanced over other means.	First-class mail received daily.		Received by tube; actually advanced in delivery.	First-class mail originating in district for delivery in same city.
		By tube.	By other means.		
	Pieces.	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*
Boston, Mass.	192,000	1,113,104	1,025,000	166,000	350,000
New York, N. Y.	505,643	2,502,099	4,132,577	294,084	953,839
Brooklyn, N. Y.	26,160	232,111	264,796	55,386	225,059
Philadelphia, Pa.	129,709	608,005	955,300	127,281	443,207
Chicago, Ill.	565,812	1,518,581	1,319,690	99,254	467,895
St. Louis, Mo.	416,014	197,651	318,088	45,528	189,561
Total	1,835,338	6,171,551	8,015,451	787,533	2,629,561

PROPORTION OF FIRST-CLASS MAIL TRANSPORTED BY TUBE.

From the preceding table it will be seen that the percentage of first-class mail sent by tube is as follows:

City.	First-class mail.	
	Dispatched by tube.	Received by tube.
	Per cent.	*Per cent.*
Boston	63.1	52.0
New York	31.1	37.7
Brooklyn	25.6	46.6
Philadelphia	42.0	38.9
Chicago	76.5	53.5
St. Louis	46.0	38.3
Average	46.6	43.5

In other words, there is a total daily of 13,632,534 pieces of first-class mail transmitted by tube out of a total of 30,176,049 pieces, or 45.1 per cent.

FIRST-CLASS MAIL ACTUALLY ADVANCED BY TUBE.

Out of a total of 15,989,047 pieces dispatched daily at the tube offices, 1,835,338 pieces (or 11.4 per cent) are reported to have been actually advanced in dispatch. Out of a total of 14,187,002 received daily, 787,533 pieces (or 10.6 per cent) are reported to have been actually advanced in delivery. The total number of pieces actually advanced daily by tube was therefore 2,622,871. The total annual pay for tube service early in October, when these statistics were taken, was $615,400 or, say, $1,686 per day.

The average cost per piece actually advanced was therefore less than one-tenth of 1 cent (six-tenths of 1 mill).

ADVANTAGES AND LIMITATIONS OF PNEUMATIC-TUBE SERVICE.

SPEED.

Probably the most attractive advantage in pneumatic-tube service is the possible speed of transmission. The contracts call for a sustained speed of 30 miles an hour between stations. This high rate

of speed is in strong contrast with the contract rate for mail-wagon service, which would range from 3 to 5 miles per hour; and also in contrast with street car and other similar service, based on a maximum speed of 8 or 10 miles.

The highest speed permissible in surface traffic in cities would be by automobile, which would be 12 miles per hour; but this maximum could not be expected in the congested streets of the business section. Hence we have in the speed attainable with the pneumatic-tube service an important factor which does not seem to be attainable in any other way.

In the early years of the pneumatic-tube service it had been apparently expected that the maximum speed of 30 miles per hour would be maintained between all points of exchange, but the present contracts in response to advertisement of June 21, 1902, merely require a speed of not less than 30 miles an hour between the general post-office and the first station, or any station and the next station. The consequence is that the maximum speed is not obtained between stations far distant from each other because of the time taken in handling the pneumatic-tube carriers at intermediate stations in transferring them from the receiver to the transmitter, and because the carriers dispatched must to a certain extent take their turns in the regular traffic of the line.

During this investigation a number of tests were made in the several cities to ascertain the actual speed by tube per hour in transmission between the general post-office and the several other stations in each city, with the following result:

City.	Minimum.	Maximum.
	Miles.	*Miles.*
Boston	14.7	25.1
New York	17.5	30.7
Brooklyn	28.2	30.0
Philadelphia	25.3	29.5
Chicago	24.8	30.0
St. Louis	25.5	30.0

It is therefore evident that when there is a long line of tubes made up of a large number of sections the speed between the extreme points is somewhat lower because of the number of intermediate relays and the exigencies of mail traffic on the line. This would be notably the case in the West Side line in New York City from the general post-office to Station L, a distance of 11.91 miles with 9 intermediate stations, on which it might be expected that in regular practice the speed between the extreme terminals would be reduced about one-third, or to about 20 miles per hour. An incidental advantage which contributes to higher comparative speed in the tube as compared with other means is the fact that the tube terminals are within the mailing rooms of the post-office, and it is not necessary to take the mail out to the dispatching platform to go through the process of checking the mail into the mail wagons, nor is it necessary at destination to go through the reverse operation.

FREQUENCY AND CAPACITY.

Previous to the introduction of pneumatic-tube service the greatest frequency of interchange between postal stations in cities appears to have been half-hourly during nineteen or twenty hours of the day. This would therefore be a frequency of about 40 dispatches in one direction, or 80 dispatches both ways daily. However, in the largest cities the number of dispatches between the general post-office and the important railway stations would be of much greater frequency than 80 per day both ways.

The frequency of wagon service both ways daily as reported during the present investigation is as follows:

Boston	92
New York	79
Brooklyn	47
Philadelphia	132
Chicago	70
St. Louis	82

The frequency provided by the pneumatic-tube service is far in excess of anything that existed before. At present the tube carriers are dispatched on intervals of thirteen to fifteen seconds, thus making 4 dispatches per minute, or 240 per hour, which for twenty hours would be 4,800 one way, or a total of 9,600 per day. The tube system therefore provides a frequency approximately one hundred times greater than formerly utilized.

The former frequency of interstation postal service in cities was naturally based upon (*a*) the number of carrier deliveries; (*b*) the number of collections; (*c*) the quantity of mail that would justify forwarding to be worked up for carrier delivery or for dispatch; (*d*) the amount of special-delivery mail. In New York City the number of carrier deliveries daily ranges from 6 to 9 or 10; the number of collections from 16 to 37 daily; and it has therefore been previously assumed that the half-hourly schedule for dispatch of approximately 80 trips both ways was a sufficient provision for this number of deliveries and collections.

The increased frequency would, however, be an extremely valuable advantage in connection with special-delivery mail, and a fairly important advantage in moving forward the accumulated first-class matter to give more time in the distributing centers for its preparation for delivery or dispatch.

This great increase in frequency is, however, somewhat offset by the reduced capacity of the carrying unit. The regulation screen mail wagon has a capacity of from 1,200 to 5,000 pounds. Hence it appears that while the frequency has been increased one hundred fold the relative capacity, compared with a regulation wagon has been decreased more than one hundred fold. The maximum capacity of the tube one way per hour (240 carriers each containing 9 pounds) would be 2,160 pounds, or, say, 1 wagonload per hour.

There is a great variation in the accumulation of first-class mail between one period of the day and another, but the capacity of the tube is invariable at all hours. We thus find a number of cases where the single-tube line is inadequate to carry all the first-class mail at the maximum period, although there is plenty of unused capacity at other hours when it is not needed.

The chief mechanical expert of the pneumatic-tube service holds the opinion, after many years of experience and study, that the economical efficiency of tube service is best represented by the 8-inch line rather than by a tube of greater diameter and that 30 miles per hour represents the highest economical speed.

The greatest available capacity would be illustrated by a tube system wherein the general post-office should be the center, with all the tube lines radiating from the center like the spokes of a wheel.

INADEQUACY.

The following instances of inadequacy are reported by postmasters:

Boston.—Between 6 p. m. and 6.30 p. m. and again between 10 p. m. and 10.30 p. m., on the line between the general post-office and the South Station, the volume of first-class mail for dispatch is so large that 10 or 15 per cent is sent by wagons as a matter of convenience in order to avoid breaking bulk and repouching the mail; yet on this same line the postmaster reports that the total use of the tubes is only 33 per cent of their capacity during the twenty hours of operation. Also at the particular times mentioned the capacity used between 6 p. m. and 6.30 p. m. is only about 60 per cent, and between 10 p. m. and 10.30 p. m. about 29 per cent.

New York.—The east-side tube line between the general post-office and Station H is inadequate northbound to carry all of the first-class mail between 8 p. m. and 11 p. m., and it is therefore necessary for the general post-office to send the mail for three very important trains—New York and Chicago railway post-office, train No. 35, at 9.30 p. m.; Boston, Providence and New York railway post-office, train No. 30, at 11.10 p. m.; and Boston, Springfield and New York railway post-office, train No. 70, at 11.01 p. m.—by wagon. The total amount of mail thus sent by wagon is said to be 206,000 pieces; in addition supplementary mail for these trains is sent by tube (about 5,500 pieces). The tube capacity of this line northbound throughout the nineteen hours of operation is only utilized to the extent of 67 per cent on the busiest section of the line.

In like manner the southbound tube is inadequate to carry the mail to the general post-office from the following important trains: New York and Chicago railway post-office, train No. 32, 4.04 a. m.; and Boston, Springfield and New York railway post-office, train No. 59, 9.35 p. m.; and from New York Central Railroad, train No. 50, due at 10.08 p. m.; and these large mails are carried to the general post-office by wagons, except that Brooklyn mail from train No. 32 (about 7,200 pieces) is sent by tube. The mail by wagon is reported to amount to 68,000 pieces daily. The southbound tube line is not used to greater than 63 per cent of its full capacity on the busiest section throughout the entire working period of nineteen hours.

Brooklyn.—No inadequacy reported.

Philadelphia.—The postmaster reports that the 6-inch tube line between the general post-office and the Bourse Station is inadequate for satisfactory service and should be increased to an 8-inch line.

Chicago.—It is reported that between 6 p. m. and 9.30 p. m. the tube line from the general post-office via La Salle Street Station to

Station U (Union Depot) is not adequate to accommodate all first-class mail to be dispatched; and wagon service is used on 30-minute and 40-minute intervals. It is said that, approximately, 110 No. 2 pouches of first-class mail are thus necessarily dispatched by wagons, which would aggregate from 250,000 to 300,000 pieces so dispatched.

Yet the greatest use of the outgoing tube line on its busiest section is 2,316 carriers daily out of a possible total of 4,800, or about 48 per cent of the possible capacity.

Also, between 7 a. m. and 7.30 a. m. there are 19 pouches of mail from incoming trains that are sent to the general post-office by wagon, which can not be forwarded through the tube because its full capacity is used at that time. Also at 8.20 p. m. 36 pouches from New York and Chicago railway post-office train No. 35 are transferred to the post-office by wagon, because it is more expeditious to do so than to break bulk for the purpose of sending it through the tube. Yet the greatest use of the tube inbound on its busiest section is 1,510 carriers during twenty hours, in which time 4,800 carriers could be dispatched at the rate of 4 per minute; hence less than 32 per cent of the full capacity of the inbound line is employed during the working hours.

It has been suggested that to correct these cases an additional tube line should be provided to run from the Chicago general post-office to Station U direct; but this would be a very expensive way to deal with the difficulty; and even if a new line were provided, the percentage of unused capacity for the old and new lines combined would, of course, be largely increased.

St. Louis.—It is reported that between 7 a. m. and 9 a. m. the line between the annex station and the general post-office is called upon for more than its capacity, when two or more important railway post-office trains arrive at the same hour, this causing a delay of fifteen to twenty minutes in getting the mail to the general post-office. Yet the postmaster reports that less than 26 per cent of the tube capacity is utilized during the twenty hours of its operation.

OTHER MAIL THAN FIRST-CLASS CARRIED BY TUBE.

While the special function of the pneumatic-tube service is to expedite the transmission of first-class mail, it is feasible to use the tube for the interchange of second, third, and fourth class mail between city postal stations, and also for particular dispatches of daily newspapers to secure close connections with trains and carrier deliveries. Registered mail can also be facilitated similarly. There is a very small proportion of all of these classes which could not go through the tube because of the large size of the individual pieces. The great bulk of the second-class (publishers') mail could not be sent through the tube, because it would break bulk and cause unnecessary and expensive handling without gain.

The extent to which the tube is employed with these other classes of mail is shown in the following summary of the reports of postmasters:

Amount of second, third, and fourth class mail carried by pneumatic tube.

City.	Second class.	Third class.	Fourth class.
Boston:			
General post-office	Insignificant	Insignificant	Insignificant.
North Station	240 pieces	55 pieces	145 pieces.
Essex Station	60 pounds		
Station A	None	80 per cent	1 per cent.
Uphams Corners	do	75 per cent	None.
Back Bay	Very rarely	Very rarely	Very rarely.
New York	Small amount	Only circulars	Special-delivery matter.
Brooklyn	625 pieces	do	Special-delivery and registered matter.
Philadelphia:			
Central	(a)	(a)	(a)
Broad street	1 per cent	1 per cent	1 per cent.
Bourse	Very little	Very little	Very little.
Station S	65 per cent	65 per cent	65 per cent.
Station O	45 per cent	45 per cent	45 per cent.
Station J	90 per cent	90 per cent	90 per cent.
Station C	do	do	Do.
Chicago:			
General post-office	372 pieces	350,567 pieces	None.
Station U	1,761 pieces	50,000 pieces	Do.
Kinzie Station		25,000 pieces	Do.
St. Louis	42 pieces	261 pieces	2 pieces.

[a] Between the hours of 5 a. m. and 5 p. m. the central office dispatches all local matter for Stations S, O, J, and C, which is 45 per cent of the whole.

REGISTERED MATTER BY TUBE.

Boston.—The special delivery registered matter is now sent by tube, but the post-office doubts the safety of the arrangement, inasmuch as the tube carriers are handled at intermediate stations by the operators, thus breaking the chain of custody by sworn employees receipting for the matter and assuming individual responsibility for it.

New York.—All registered mail of suitable size for local interchange is sent through the tube between the stations connected by tube.

Brooklyn.—Registered mail is dispatched by means of inner-tube carriers, there being 14 trips on week days, aggregating about 25 carriers (three trips on Sundays and four on holidays).

Philadelphia.—The central post-office uses the tube for supplementary dispatches of registered mail, as does also the Broad Street Station, and this is regarded by the post-office as a very important service. The Bourse Station does not use the tube for registered mail. Station S dispatches 50 per cent of its registered mail by tube, but receives only special-delivery registers thereby. Station O dispatches 90 per cent of its registered mail by tube, and receives all registered mail for delivery thereby. Stations J and C both dispatch and receive only special-delivery registered mail.

Chicago.—It is expected to use the tube for local registered mail, which averages about 475 pieces per day, but arrangements have not as yet been made.

St. Louis.—The tube service is used freely for the interchange of registered mail, and the service is regarded as very important. Between the general post-office and the annex station (Union Depot) it is said that 1,021 pieces of registered matter are sent both ways daily, and between the general post-office and Bridge Station about 84 pieces daily.

COMPARATIVE TONNAGE SENT BY TUBES.

From the reports submitted by postmasters an estimate has been prepared to show the comparative weight of mail matter sent through the tubes. It is not exact, but illustrates to some extent the relative tonnage (all classes of mail matter) sent by tubes and otherwise:

City,	Total tonnage daily (all mail and equipment).	Tonnage dispatched by tube.	Per cent by tube.
	Tons.	*Tons.*	
Boston, Mass	77	24	31.0
New York, N. Y	377	48	12.7
Brooklyn, N. Y	14	3	21.0
Philadelphia, Pa	94	27	28.0
Chicago, Ill	259	41	15.8
St. Louis, Mo	75	13	17.0
Total	896	156	17.4

PERCENTAGE OF TUBE CAPACITY UTILIZED.

The reports of postmasters showing the number of tube carriers dispatched daily have been tabulated to show the percentage of capacity utilized in each section of the tube line with the following result (the maximum number of carriers per hour is assumed to be 240 each way):

City and section.	Length of line.	Time operated daily.	Capacity utilized.
	Miles.	*Hours.*	*Per cent.*
Boston:			
General post-office to North Station	.875	20	16.4
General post-office to South Station	.645	20	26.7
South Station to Essex Station	.56	20	6.1
Essex Station to Back Bay Station	1.08	20	5.2
Essex Station to Station A	1.24	20	6.3
Station A to Roxbury Station	1.07	20	4.1
Roxbury to Uphams Corners	1.42	20	2.2
New York:			
General post-office to Madison Square	2.73	19	64.8
Madison Square to Station H	1.68	19	66.6
General post-office to Hudson Terminal	.42	19	47
General post-office to Station P	.94	17½	27.3
General post-office to Station A	1.35	19	52.3
Station A to Station O	1.13	19	37.4
Station O to Station E	1.17	19	28.2
Station E to Times Square	1.13	19	26.1
Times Square to Station G	1.17	19	26.1
Brooklyn:			
New York general post-office to Brooklyn general post-office	1.65	19	13.8
Brooklyn general post-office to Station L	1.35	19	5.6
Philadelphia:			
General post-office to Broad Street Station	.72	20	33
General post-office to Bourse Station	.56	9½	16.3
General post-office to Station S	1.41	20	5.5
Station S to Station O	1.21	20	3.5
Broad Street Station to Station J	1.23	20	4.5
Station J to Station C	.88	20	2.75
Chicago:			
General post-office to La Salle Street Station	.55	20	39.8
La Salle Street Station to Station U	.82	20	26.8
General post-office to Illinois Central Station	1.27	20	20
Illinois Central Station to Twenty-second street	1.02	20	8.4
Twenty-second street to Armour Station	1.02	13	12.1
Armour Station to Stockyards Station	2.73	13	7.1
St. Louis:			
General post-office to Annex Station	1.3	20	29.2
General post-office to Bridge Station	.55	13	4.3

It appears that the greatest percentage of use is in New York between Madison square and Station H, 66.6 per cent, while the smallest is in Boston, Roxbury to Uphams Corners, 2.2 per cent, and in Philadelphia, Station J to Station C, 2.75 per cent.

The mileage accounted for in the above table is 36.32, and excludes about 6 miles in New York City opened in November, and is not yet in full operation.

It is to be noted that only three sections show a use of over 50 per cent of their capacity. These are all in New York, and represent a length of 5.76 miles.

The table may be summarized as follows:

	Miles.
Mileage on which over 50 per cent of capacity is used	5.760
Mileage on which over 25 per cent, but less than 50 per cent, of capacity is used	9.995
Mileage on which over 10 per cent, but less than 25 per cent, of capacity is used	3.795
Mileage on which under 10 per cent of capacity is used	16.770
Total	36.320

Hours of operation of pneumatic-tube service.

City.	Distance.	Hours operated.		Scheduled hours of operation.		Changes recommended by postmasters.
		Week days.	Sundays.	Week days.	Sundays.	
	Miles.					
Boston, Mass	6.853	20.0	11.50	3.30 a. m. to 11.30 p. m.	7 to 10.30 a. m. and 3.30 to 11.30 p. m.	To increase scheduled hours of service from 20 to 24 at Back Bay and Essex Street stations, and 1 hour longer (11.30 p. m. to 12.30 a. m.) at North and South stations.
Except—						
General post-office to North Station.	.875	20.0	12.25		5 to 10 a. m. and 4 to 11.15 p. m	
General post-office to South Station.	.645	20.0	15.00		5 to 10.30 a. m. and 2 to 11.30 p. m.	
Chicago, Ill	2.640	20.0	6.00	5 a. m. to 1 a. m.	7 a. m. to 1 p. m.	Stock Yards increase hours of operation from 13 to 15, or until 8 p. m.
Except—						
Twenty-second Street Station	4.770	13.0	5.50	5 a. m. to 6 p. m.	7 a. m. to 12.30 p. m.	
Armour Station						
Stock Yards Station						
New York, N. Y.	20.66	19.0	5.00	4 a. m. to 11 p. m.	4 to 9 a. m.	Increase in hours of service on Sunday from 5 to 12, so as to be from 6 to 11 a. m. and 3 to 10 p. m.
Brooklyn, N. Y.	1.35	19.0	5.00	4 a. m. to 11 p. m.	4 to 9 a. m.	Do.
Philadelphia, Pa.	4.74	20.0	11.50	4.30 a. m. to 1.30 a. m.	5 to 8 a. m. and 5 p. m. to 1.30 a. m.	Tube closed 12 noon to 1 p. m.
Except—						
General post-office to Bourse Station.	.56	9.5		9 a. m. to 12.10 p. m. and 12.40 to 7 p. m.		No change.
General post-office to Broad Street Station.	.72	20.0	11.00	4 a. m. to 12 p. m.	4 to 8 a. m. and 5 to 12 p. m.	Do.
St. Louis, Mo.	1.30	20.0	8.00	4 a. m. to 12 p. m.	7 to 11 a. m. and 4.30 to 8.30 p. m.	Do.
Except general post-office to Bridge Station.	.55	13.0	4.00	6 a. m. to 7 p. m.	7 to 11 a. m.	Do.

ECONOMIES EFFECTED.

The establishment of tube service superseded, in whole or in part, service that had been in operation by other means of transportation at each city where the pneumatic tube has been provided. The amount actually saved can not be stated with exactness for the reason that the changes in most instances were in connection with the rearrangement of screen-wagon and electric-car routes, making it difficult to determine the actual decrease occasioned by the establishment of tube service.

The amounts of such saving as are determinable are given below, approximately, as follows:

Boston, Mass	$5,510
Brooklyn, N. Y	5,942
New York, N. Y	69,848
Philadelphia, Pa	13,193
Chicago, Ill	2,400
Total	96,893

At points where wagon service is in operation and the establishment of pneumatic-tube service causes a decrease in the number of trips performed, no saving is actually made in the cost of service until the wagon route has been advertised and relet, and then it is absorbed in the general increase in the cost of service. The provisions of the wagon contracts are such that the department can not decrease the pay for decreased service during the contract term.

COMMENTS OF POSTMASTERS IN PNEUMATIC-TUBE CITIES.

In response to the request of the subcommittee that postmasters furnish any additional information (not contained in their statistical reports) regarding the comparative importance of pneumatic-tube service in carrying the mails, comments were made as follows:

BOSTON, MASS.

Apart from the statistics and the answers to the specific queries, the pneumatic-tube system in Boston is considered an essential factor in that portion of the city which is affected with a congestion of traffic, but beyond such limits the service may be regarded as purely auxiliary. * * *

While the auxiliary character of the service is shown in the foregoing paragraphs, the essential features of the service pertain to the central office district, where there is a congestion of traffic due to narrow streets and the heavy volume of business. This phase of the situation is prevalent throughout the year, but the effects are felt particularly in a long and severe winter marked with blockading snowstorms, which make it impossible to maintain wagon schedules, and any system of transportation which overcomes these difficulties is of the utmost importance and value to this office. The pneumatic-tube service has supplied this need, and its reliability is commendable.

NEW YORK, N. Y.

I deem it proper to say that in my opinion the entire value of the pneumatic-tube service can not be definitely measured by the statistics furnished thereon, because, while the proportion shown as being actually advanced is comparatively small in percentage, there are many other features of pneumatic-tube service which render it of exceptional value over other forms of transportation, among which is the fact that the tube service is always available for immediate use; that its advantages during snowstorms or other weather conditions which interfere with transportation are manifold; that its value to the special-delivery

system is such that all of this class of matter sent by tube during special-delivery hours is advanced by the fact that it is specially delivered instead of waiting regularly scheduled carriers' delivery. Also, that while the figures in the case of distributing matter are based upon supplemental dispatches, or matter which is advanced for actual train connections by tube over what would be possible by wagon, and in the case of city matter, that which actually connects with carriers' deliveries which would not so connect if forwarded by other means, the whole of the matter which is forwarded by pneumatic tubes is, as a matter of fact, advanced because of the shorter transit time required, thus enabling the clerks at stations as well as in railway postal cars to sooner begin the work of separation and distribution, etc., from which it will be seen that the benefits of tube service, while manifest, are extremely difficult of expression in statistics.

BROOKLYN, N. Y.

In addition to the statistics furnished, it can be stated that the advantage of tube transmission would embrace the number of pieces advanced over other means, or actually advanced in delivery, or advanced to make railroad connection. The percentages as shown by form No. 2 are naturally based on the present service, such as wagons and electric street cars, but it should be taken into consideration that this means of transportation is now being performed at a minimum. The tube advantages in percentage would be materially reduced as the other means of transportation were increased in frequency. One natural advantage that the tube has over other kinds of service is that it is always available for use, thereby allowing continuous service.

PHILADELPHIA, PA.

In addition to the information specifically called for, I would state as illustrating the comparative importance of pneumatic-tube service that by the use of pneumatic tube we are enabled to have direct communication between the central office and our stations at all times, while under the old system of wagon and electric car service this connection was only at stated intervals with an hour or more apart. This is a great advantage, especially in the treatment of special-delivery letters; it also enables us to make very close connection with carriers' deliveries.

CHICAGO, ILL.

I beg to acknowledge receipt of your letter of the 18th instant, requesting an expression of views as to the comparative importance of the pneumatic-tube service otherwise than as indicated in data already furnished on the subject. With the view to obtaining practical views along this line, based on experience and actual service conditions, the matter was taken up with the superintendents of the mailing, delivery, and registry divisions of this office. For the information of yourself and your committee, I beg to quote herewith from the reports of the officials named, wherein each expresses his opinion on the subject in question, together with the reasons therefor. It is thought that the statements of the superintendents of the mailing and delivery divisions quite fully describe local conditions and indicate wherein the tube service has advantages over other methods of mail transportation, and wherein it is handicapped.

The superintendent of mails' statement is as follows:

"The wagon service is constantly subjected to the danger of delays in consequence of the extreme congestion of the streets in this city and also because of the masses of wagon traffic in and about the railway depots. During the winter months, when the roadways are covered with ice and the horses find difficulty in obtaining foothold, it frequently is impossible to maintain the running time. The contractor often is aided at both ends of the line, so as to give more time during these periods; but even by cutting short the processes of loading and unloading and using every practicable 'short cut' the danger remains when the streets are slippery. More than 50 per cent of the mails received and dispatched here have to be carried over the bridges spanning the Chicago River, where the frequent opening of the draws is productive of delays.

"For short distances, and when the volume of mail to be transported is very large, the wagon service compares favorably with the pneumatic-tube system; but under ordinary circumstances, and especially when the conditions

noted above have to be met, the wagon service necessarily suffers in comparison."

"In illustration of the foregoing statements it is literally impossible to submit any specific instances. I am more fortunate, however, in the matter of a reply to the inquiry contained in the last paragraph of Superintendent Bradley's communication. It will be remarked from the following example that there is a very marked difference in favor of the tube system in the celerity of performing the service to and from the Chicago and Northwestern Depot:

"Chicago, Cedar Rapids and Council Bluffs Railway post-office train No. 9 departs from Chicago and Northwestern Depot at 10 p. m. Under the present wagon schedule, distributers at the post-office tie out the mail for this close at 9.15 p. m. The pouches lock at 9.25 p. m. and reach the dispatching platform for wagon leaving post-office at 9.30 p. m. With the tube service in operation, the final tie-out by distributers would occur at 9.35 p. m. for final tube dispatch at 9.45 p. m., which would allow for the further distribution of mails for Chicago, Cedar Rapids and Council Bluffs train 9 up to 9.35 p. m.—an additional twenty minutes leeway. An average of 8 No. 2 pouches would be worked during this interval of twenty minutes, and a crude estimate of the additional number of pieces which could be connected by tube would be as follows: Seventy-four distributers handling an average of 40 pieces per minute for twenty minutes would be 59,200 pieces over and above what could be connected in pouches dispatched from post-office by wagon. On the basis of 12 packages to a tube carrier, and 7 tube carriers or 84 packages to a pouch, it would require 56 tube carriers to transmit this mail, and with an interval of thirteen seconds between the dispatch of each tube carrier it would consume a trifle over ten minutes in transmission.

"The principal advantage which the tube service holds over screen wagons is that in consequence of its celerity in transmission more time is allowed for the distribution of mails at the post-office, and consequently it is thus possible to connect with important trains a considerable quantity of mail which otherwise would have to be dispatched via the next subsequent train if forwarded by wagon.

"If screen wagons could proceed at a fair pace without interruption, if the roadways always were good, and if there were no drawbridges to cross, the advantage of the tube system would be considerably reduced, but its greatest value as shown in the example herein still would exist."

The following is from the statement of the superintendent of the delivery division, and while it does not go into the matter as fully as the foregoing statement, yet it indicates the direct advantages accruing to the delivery service:

"There is a marked advantage in the transmission of city mail and what is known as 'road mail' from the railway post-offices from depot stations to other stations, viz, from Station U to Stock Yards and stations south of Stock Yards which receive mail from there by the street railway post-offices, viz, Englewood and Fifty-first street stations; also from Station U to Twenty-second street and stations south, viz, Stations M, Hyde Park, and Jackson Park. This will also apply to La Salle Street and Illinois Central tube stations to Stock Yards and Twenty-second street stations; also from the tube station at the Chicago and Northwestern Depot, if in operation.

"There is not any marked advantage in the dispatch of mail via tube from Station U to the general post-office or from La Salle Street tube station to the general post-office, owing to the fact that the time gained in transmission is very slight when it is considered that all pouches which arrive at these tube stations have to be opened and pneumatic-tube carriers loaded in order that mail be dispatched. There would be a very marked advantage if a full pouch of mail could be forwarded via tube service.

"Regarding service to and from the Chicago and Northwestern Depot as compared with service during the time when tube was in operation, it must be admitted that the present service via wagon messenger is not as satisfactory as tube service.

"It is doubtful if a succinct statement could be made which would convey clearly the disadvantages to the city mail through the suspension of tube service between the Chicago and Northwestern Depot and connecting tube terminals and tube stations."

At this time registered mail is not being dispatched by pneumatic tubes. The superintendent of the registry division was requested, however, to express his views on this particular subject, and his statement along those lines pointing out the advantages for that branch of the service is as follows:

"The use of the tube will greatly expedite the handling of city matter by giving direct service between delivery stations; for instance, when the tube is again in operation between this office and the Chicago and Northwestern Depot, it will be possible to receive a piece of registered mail at Kinzie Station at 3 p. m., and connect it via the tube with the last carrier delivery from the Stock Yards Station, leaving at 3.30 p. m., approximately a distance of 5 miles; whereas, under present conditions of transportation service, a letter must be registered at Kinzie Station before 11 a. m. to connect with the last carrier delivery from the Stock Yards Station. From a registry standpoint, therefore, the pneumatic tube is necessary in an up-to-date, modern service."

The information contained in the foregoing statements indicates advantages in the tube service under certain conditions and circumstances, especially in the city delivery service, in the way of expediting dispatches between tube stations and other stations contiguous thereto by the present street railway postal service to the latter. These advantages would seem to more than offset the shortcomings of the tube through insufficient capacity to handle the greater volumes of mail between depots and the post-office, and vice versa.

ST. LOUIS, MO.

The tube service (as regards registered mail) is indispensable for a prompt dispatch of this important mail between the annex station and the main office. The large and important mail for our banking institutions is especially benefited by this exceedingly quick service, and it has to them become a necessity inasmuch as practically all the registered mail received in annex station in the forenoon is delivered before the opening of the clearing house. In the afternoon the tube service between the main office and the annex station is equally important for the dispatch of registered mail, as it is impossible to prepare the mail received from 5.30 to 6 p. m. in time for dispatch by wagon to insure its leaving the city the same day, but with the aid of the tube service the mail is sent to annex station at short intervals, thus connecting all outgoing dispatches the same day.

TUBE-SERVICE CONTRACTS.

In general throughout all of the cities named the tube service consists of a double line of tubes 8 inches in diameter, except in Philadelphia, where there is a section consisting of double lines of 6-inch tube, and in Boston, where there are several sections consisting of double lines of 10-inch tube.

BOSTON, MASS.

The 8-inch double tube lines in this city connect the general post-office and the North Postal Station, the general post-office and the South Postal Station, and the South Postal Station and Essex Station, a total of 2.08 miles. The double lines of 10-inch tubes connect Essex Station with Back Bay Station, and Essex Station with Station A and Roxbury and Uphams Corners, a total of 4.81 miles, making an aggregate for both 8 and 10 inch tubes of 6.89 miles. This distance, however, by consent of the contracting company, is rated as 6.652 miles in the existing contracts. It should be said with reference to the 10-inch tubes that the Government does not have the advantage of the possible capacity of this larger line, because under the existing method of operation the 8-inch carriers are used to carry the mail, these carriers being placed inside of the 10-inch carriers for transmission through the 10-inch line.

The 10-inch tube was not originally built for the United States postal service, but for commercial purposes in the transmission of parcels. In arranging the pneumatic-tube system in Boston, the line as thus laid, with some modifications, was found to be available for postal purposes.

The contracting company is the Boston Pneumatic Transit Company, William H. Ames, president. We learn from this company, and from its allied interests, that it is owned by the Massachusetts Pneumatic Tube Company. This last-mentioned company is owned by the American Pneumatic Service Company, William H. Ames, president. The entire pneumatic-tube service contracted for in Boston is in operation.

NEW YORK, N. Y., AND BROOKLYN, N. Y.

In New York and Brooklyn the equipment consists throughout of double lines of 8-inch tubes, representing at the present time (November 10) about 20.65 miles. The contracting company for the service in both cities is the New York Pneumatic Service Company (which was incorporated June 22, 1906), William H. Ames, president. We learn from the contracting company that the entire capital stock of this company is owned by the American Pneumatic Service Company. It also appears that the New York Pneumatic Service Company is the successor of the Tubular Dispatch Company, which was the original contractor for pneumatic-tube service in the Borough of Manhattan, having acquired the entire assets of the Tubular Dispatch Company, paying for them the entire capital stock of the New York Pneumatic Service Company. The American Pneumatic Service Company acquired this stock of the New York Pneumatic Service Company after the foreclosure sale as a result of its ownership of bonds and stock of the Tubular Dispatch Company. We understand that the Tubular Dispatch Company is no longer in existence.

Another of the early contracting companies was the New York Mail and Newspaper Transportation Company, which was the original contractor for the tube service between the New York general post-office and the Brooklyn general post-office. This same company subsequently (1902–1906) was the contracting company with the Post-Office Department for all pneumatic-tube service then being performed in both New York and Brooklyn.

This company is still in existence, but is controlled by the American Pneumatic Service Company.

It appears that neither the New York Pneumatic Service Company nor the New York Mail and Newspaper Transportation Company hold either the stock or bonds of the other company, but as fast as the plant of the New York Mail and Newspaper Transportation Company is constructed under contract it is leased to and operated by the New York Pneumatic Service Company.

The entire mileage contracted for in New York is not yet in operation. According to the Post-Office Department records the total mileage contracted for at the present time is 28.66, of which approximately 20.65 miles were in operation November 10, leaving apparently 8 miles yet to be completed. The tube company's figures, including sections the length of which has not been finally passed upon by the department, represent a total mileage for the completed system of 28.9797, of which their record shows 8.3147 still uncompleted. These uncompleted sections are a cross-town line from Times square to Station H; the upper east-side line from Station H via Stations Y, K, U, to L; also west-side connections from Station O via C to Foreign Station; also connection between Station S and the

present east-side line. Of these sections the only portion actually under construction is the cross-town line between Times square and Station H, which is understood to be very near to completion, and expected to be in operation by January 1, 1909.

The difference between the total mileage contracted for (28.66) and the total mileage as computed by the company (28.9797) is accounted for by the fact that in the actual construction the company has believed it necessary to follow routes which do not represent the shortest possible distance between the points to be connected, although the company evidently regards them as the shortest practicable distance between the points to be connected. A number of these sections where the difference in distance will appear are yet to be passed upon by the department as to the mileage that can be accepted for payment.

PHILADELPHIA, PA.

The service in Philadelphia consists of double lines of 8-inch tubes, except between the general post-office and Bourse Station, this last line being a double line of 6-inch tubes, a distance of 0.56 mile. The total service in Philadelphia in operation November 10 was therefore 5.462 miles of 8-inch tubes and 0.56 mile of 6-inch tubes—total, 6.022 miles.

In addition to this there is a new 8-inch line running from the general post-office via Southwark Station to Station D, 1.902 miles, which is completed and tested and went into regular operation on November 23. There also remains the line contracted for between the general post-office and the Reading Terminal Station, 0.2735 mile, the construction of which has not yet been commenced. This makes a total of 8.1975 miles under contract, but in addition to this the department has approved of an extension from Station O via Fairhill to North Philadelphia, 1.72 miles, although no contract has as yet been made for the construction of this line. There is therefore a total of 8.1975 miles contracted for, with an expected total of 9.9175 miles whenever the tube company will agree to construct the line to North Philadelphia upon the terms authorized by law.

The contracting company in Philadelphia is the Pneumatic Transit Company, James B. Mabon, president. This company was incorporated in the State of New Jersey January 8, 1892, and is understood to hold no relation to the contracting companies in other cities except that by formal arrangement through the Batcheller Pneumatic Tube Company with the American Pneumatic Service Company it holds joint ownership with that company in the use of the patents of both of the companies for the operation of pneumatic-tube service. This understanding includes a partition of territory, the Pneumatic Transit Company having exclusive ownership of the joint patents within the city of Philadelphia and within a radius of 20 miles of the city of Camden, N. J.

CHICAGO, ILL.

The pneumatic-tube lines in Chicago are of the 8-inch pattern throughout. The service contracted for is 17.563 miles. The service in operation is 7.41 miles. In addition to the mileage in operation there is a line, temporarily out of use, running from the general post-office via Wells street terminal to Kinzie Station, in the Chicago and

Northwestern Railway depot, a distance of 1.77 miles. The suspension of service on this line took effect March 4, 1907, being due to action of the War Department in removing the old street-car tunnel under the Chicago River, which incidentally destroyed the pneumatic-tube connection under the river which was laid in the tunnel.

The tube company has promised a number of times to restore this broken connection, but have not done so. This suspended line, in addition to the mileage under operation, accounts for a total mileage of 9.18 (according to the company's figures), thus leaving about 8.383 miles yet to be constructed. The new line when built would provide connection from Station U, via Stations C and D, to Douglas Park; also from Station U to Pilsen Station; also from Station C to Carpenter Street Station. No work has as yet been done on these extensions; in fact, the contracting company has built no new mileage since March, 1905.

The contracting company in Chicago is the Chicago Postal Pneumatic Tube Company, William H. Ames, president (incorporated in 1902 in the State of Illinois). The capital stock of this company is owned by the American Pneumatic Service Company. The local franchise under which the Chicago Postal Pneumatic Tube Company operates is for a term of twenty years, and seems to be exceptional in some of its provisions as compared with other cities. For instance, it provides that at the end of ten years the city of Chicago has the right to purchase the system on a fair appraisal, or by establishing the value by arbitration. It provides, further, that if the grantee does not receive the mail-carrying contract from the United States Government at any time during the life of the franchise, in such event the city of Chicago shall have the right to require the grantee to sell to any person, firm, or corporation which shall receive the contract from the United States Government all of its plant in the public street, etc., the value to be arrived at in the same manner, by appraisal or arbitration. It is provided that at the expiration of the twenty-year period all of the tubes then in the streets, alleys, etc., shall become the absolute property of the city of Chicago.

ST. LOUIS, MO.

The pneumatic-tube lines in St. Louis are all of the 8-inch pattern. The contracts call for 3.46 miles, and the mileage in operation is 1.85 (company's figures, 2.09) miles. The difference is principally accounted for by the fact that the original intention was to have a line from the St. Louis general post-office to Relay Depot, in East St. Louis, but this line was built only from the St. Louis general post-office to the western terminus of the Eads Bridge (Bridge Station), and during the time of construction the route of the principal mail trains entering St. Louis was changed, so that it is no longer of importance to have pneumatic-tube connection with the Relay Depot in East St. Louis.

The contracting company is the St. Louis Pneumatic Tube Company, incorporated in the State of Missouri in 1902, William H. Ames, president. The capital stock of this company is owned by the American Pneumatic Service Company.

SUMMARY.

Reviewing the conditions as above described there appears to be a total of 42.59 miles of double tubes, of which about 37.22 miles are 8 inches in diameter, 4.81 miles are 10 inches in diameter, and 0.56 mile is 6 inches in diameter.

While there is a separate contracting company in each city, there are, in fact, only two companies in control of the companies which own the lines and patents, so far as the existing pneumatic-tube service is concerned, namely, the American Pneumatic Service Company, of Boston, Mass., for Boston, New York, Brooklyn, Chicago, and St. Louis, and the Pneumatic Transit Company as regards Philadelphia.

There is another company which should be mentioned for a complete understanding of the pneumatic-tube situation, viz, the Batcheller Pneumatic Tube Company, incorporated in West Virginia; home office, Philadelphia, Pa. This company, we understand, owns a large number of patents in relation to pneumatic-tube service, as does also the American Pneumatic Service Company; but by agreement between the two companies just mentioned the American Pneumatic Service Company controls the right to use the Batcheller Company's patents (as well as its own) for the entire United States, excepting only the State of West Virginia, the State of Pennsylvania (excluding Pittsburg), and Camden, N. J. The Batcheller Pneumatic Tube Company has reserved the right to use its own patents in foreign countries and in Pennsylvania (excluding Philadelphia and Pittsburg), West Virginia, and Camden, N. J. The Batcheller Pneumatic Tube Company and the American Pneumatic Service Company jointly have the right to use any improvements or future inventions developed in either company within the spheres of action just described.

We understand that the Batcheller Pneumatic Tube Company has endowed the Pneumatic Transit Company with the right to use the joint patents in Philadelphia, Pa., and Camden, N. J., and within 20 miles thereof, but still retains the rights to use the joint patents in the State of Pennsylvania (except Pittsburg and Philadelphia) and in the State of West Virginia.

Hence, if the United States Government purchased from the American Pneumatic Service Company and the Pneumatic Transit Company all of their property and rights in connection with the performance of pneumatic-tube mail service, it would apparently possess all of the patents of both the American Pneumatic Service Company and the Batcheller Pneumatic Tube Company for the performance of pneumatic-tube mail service in the entire United States, except the State of Pennsylvania (excluding Philadelphia and Pittsburg) and the State of West Virginia. In these States (Pennsylvania, excluding Philadelphia and Pittsburg, and West Virginia) the Government would possess the patent rights of the American Pneumatic Service Company, but would not possess the patent rights of the Batcheller Pneumatic Tube Company.

All of the existing contracts for pneumatic-tube service will expire June 30, 1916.

DESCRIPTION OF PNEUMATIC-TUBE SYSTEMS.

A pneumatic-tube system is a method of sending a carrier through a pipe at a high rate of speed, either by pressure or vacuum, and bringing it to rest without damage.

Station terminals.—Each postal station on the pneumatic-tube route is equipped with sending and receiving apparatus, known as "transmitter and receiver."

Piping.—The pneumatic tubes consist of double lines of cast-iron pipe of high grade, the inner crust being reamed out to form a smooth interior, with leaded joints, laid in 3-foot trenches underneath the streets at a depth of 4 feet, or below the frost line, and must form, when laid, perfect conduits for the passage of steel cartridges at a high rate of speed. Obstructions in the streets and other piping are avoided by carrying the pipe to one or the other side, or up or down, at true curvatures, to permit carriers to slide along without reduction of speed.

Double lines are required to carry the traffic in opposite directions. The piping in passing from one street to a cross street or into and out of buildings is carried by bends of a proper curvature, and if at a right angle by bends of 90°.

Bends.—The bends, formerly made of brass and bent to the required curvature at great expense, are entirely superseded by cast-iron bends, bored out smoothly by machines of ingenious contrivance, one form in sections of 6-foot lengths, with flanges, whereby bends of any length may be formed by combining the short sections; and another form of 12-foot sections, divided into halves longitudinally, reenforced by heavy metal backing, with flanges, so as to be bolted together.

Motive power.—The power to propel the carriers through the line is a current of air, which is maintained constantly through the tube under varying pressures, according to the length of line, the number of carriers, and the weight of the mail to be transported. Air compressors of duplex type and rotary blowers, steam or electrically driven, may be used.

Dispatching apparatus.—The form of transmitters now commonly in use is known as the gravity type, set in the floor of the tube station at an angle of 45°, and are formed of an air chamber, with upper and lower gates, operated by pistons or counterbalanced, and the dispatching is effected by placing the carrier in a "scoop" against the top gate, which opens when the interval of time fixed by the time lock is passed, allowing the carrier to fall into the air chamber, which has an auxiliary pipe connecting with the main pipe bringing pressure behind the carrier, and forcing it through the lower gate and into the line, whence it is taken along by the air current until it reaches the next station.

Another form of transmitter called the "cradle" is used where the terminals are so situated that the space for the necessary piping below the level of the transmitter can not be obtained. The dispatching is effected by placing the carrier in a horizontal scoop, placed at one side of the machine, whence it is slid into a section of pipe, which, when the interval of time fixed by the time lock is passed, is swung into position in the main tube line by an air piston, and the force of

air being then exerted against the carrier, it is sent through the line to the next station.

Receiving apparatus.—Two general forms of receivers are in use, the open and the closed types. The "open" receiver has no valve at the end of the line and the air current is induced to flow into a receiving tank placed near the terminal (by means of a vacuum, created by pumping air from it into the outgoing tube) instead of passing out the open end of the line. A circular table, the outside edge of which is formed of a half longitudinal section of tube, holds the carrier to its proper position, and by the friction created brings it to rest upon the receiving table. This being inclined toward the front, the carrier rolls down to a point within reach of the operator, and out of the way of the succeeding carrier. This open form of receiver (i. e., without gates) permits of a greater number of carriers being transmitted through the line. The "closed" receivers are made with one and two valves, which may be of the sluice-gate or revolving-valve type. The single-valve receiver has one gate or valve at the end of the line, and the arriving carrier compresses the air against it, forming an air cushion, checking the speed of the carrier and bringing it to rest. The compression of the air in the dead end of the tube, applied through auxiliary piping, operates a piston raising the gate or opens the valve, and further auxiliary air piping, connecting with the main tube back of the gate, ejects the carrier onto the receiving table, and it is brought to rest against a spring or compressed air buffer.

The single-sluice gate or revolving-valve receiver is required on a line at the farthest point from the air-compressing power plant, and is used on lines the length of which and the load to be transported demands heavy initial pressure to force the carriers through the line at the contract rate of speed of 30 miles an hour as a means of safely receiving the carriers and of forcing the air current through suitable by-pass into a receiving tank to be again used. This form of receiver permits the receiving of carriers every ten seconds and is used at points where power plants are located.

The double-valve receiver is used at points intermediate on a line where no power plant is located and permits the current of air to pass around the intermediate station by suitable by-passes connecting with the tubes on either side, without loss of density or checking the flow.

The double-valve receiver has two sluice gates or revolving valves which act together, one of which is always closed while the other is open. Normally the one nearest the end of the line is closed, so that the arriving carrier forms an air cushion against it. If one carrier is in the act of being discharged onto the receiving table through the end gate, the second gate is closed to form the air cushion for the next arriving carrier, checking its speed, but operating to deliver the carrier as soon as the first one is out of the way. This form of receiver will safely permit of intervals between carriers of about thirteen seconds, although the double valves will perform the function of receiving and delivering a carrier in from four to five seconds.

The "tilting" receiver is another type of closed receiver. It is a section of the pipe arranged to form a dead end into which the arriving carrier runs. A piston operating by the pressure of air in the dead end drops one end of this tube section and discharges the carriers onto a receiving table.

Carriers.—The carrier used is a steel shell, cylindrical in form. For an 8-inch line the carrier would be about 23½ inches long, for a 6-inch line about 18 inches long, and for a 10-inch line about 30 inches long. The surface of the carrier is galvanized to prevent rust. The carrier has a permanent bottom at one end and a hinged cover at the other. The bottom is in the shape of a cup, which is slid over the end of the shell and brazed thereto. The bottom also bears on its outside a leather or felt buffer, so that as the carrier passes through the tube, bottom foremost, the buffer end takes up the shock at the terminus. The hinged cover, after being closed, is fastened tight by means of an eccentric lever connecting with inside bolts, which engage the upper rim of the cylinder in appropriate slots. This lever projects over the edge of the cover when unlocked, thus forming a telltale device to prevent the dispatch of a carrier unlocked.

The outside of the carrier is protected from direct contact with the tube itself by means of two bearing rings, each of these being situated about 1 inch from either end of the carrier. These bearing rings (made of cotton duck and rubber composition) are so made as to fit exactly the interior of the tube, and thus prevent the slippage of air past the carrier. Experience with the 8-inch tube shows that these bearing rings must not be allowed to wear down greater than one-eighth of an inch, because at such lessened diameter it is unsafe to use them. There would be danger of a tightly fitting carrier overtaking a loosely fitting carrier in the tube, with possible disastrous collision and possible blocking of the entire tube. The length of the carrier is ordinarily three times the diameter of the tube used and the diameter about 1 inch less than the diameter of the tube, the thickness of the shell of the carrier and the bearing rings taking up the difference, or 1 inch of the diameter.

VARIETY OF MACHINERY IN USE.

There is great variety in the terminal machinery and power plants employed in the present pneumatic-tube system used in transmitting the mails, this condition representing no doubt successive stages of experiment and experience on the part of the operating companies; but evidently no conclusion has been reached for completely standardizing the machinery or for selecting for general use the best type that has been evolved.

Receivers.—There are at the present time in use 76 receiving machines, and we find that these are of 10 different types, some of them concededly obsolete so far as the highest efficiency of service is concerned, but nevertheless in use.

Transmitters.—There are in use at the present time 76 transmitting machines, and we find that these are of 7 different types, although it is believed to be conceded that the gravity form transmitter is the most serviceable and should supersede the other types still in use.

Pressure plants.—For producing air pressure there are in the present systems 56 compressors of 7 different types and 14 blowers of 2 different types, thus making 9 varieties of machinery for this purpose. Aside from the broad difference between the two methods of securing air pressure, i. e., by compressors or by blowers, the other variations in type are due either to the kind of power used—whether

steam or electric—or in the manner in which this motive power is connected with the compressing machines.

Motive power.—Where the power plant is located in a federal building steam power is employed (steam being purchased from the Treasury Department at cost) and 3 or 4 varieties of steam engines used. In all other places electric motors are employed, there being 52 such motors. Here again there is a variety, there being 29 operating with direct current and 23 operating with alternating current. These 52 motors are of 10 different sizes, ranging from 12.74 horsepower in the smallest to 105 horsepower in the largest.

The mature opinion of the chief pneumatic-tube expert as recently expressed to this committee is that the best practice would be to operate the tube line in short sections of a mile or less in length, with a power plant at each station, using preferably blowers rather than compressors to secure the air pressure in the tube, and using preferably for teminal machinery the gravity transmitter and the open circular table receiver. The reasons given were that while a power plant at each station would mean a heavier initial cost, yet the annual cost of operation would be lower and the line would be insured from stoppages in operation due to accidents and blockades. (The necessity for relaying carriers at each station would unavoidably delay somewhat their progress to ultimate destination.) The blower was preferred to the compressor because of lower initial cost of installation and because it occupies less space.

REVIEW OF TEN YEARS' EXPERIENCE.

Although the experimental line in Philadelphia commenced service as early as 1893, the first practical experience of any general character commenced in 1898, when there were about 8 miles in operation in Boston, Philadelphia, and New York. There has therefore been about ten years' experience with the pneumatic-tube service, although even yet there is not a complete system in any one city, and the chief and most satisfactory test of the service would be obtained in a general system, especially in cities like New York and Chicago.

When the first extension of pneumatic-tube service was under consideration, in 1896, the comparison was with mail-wagon and street-car service.

Automobiles were in the infancy of development, and although alluded to in the Annual Report of the Second Assistant Postmaster-General for 1896 as a possibility, they were styled "horseless wagons." Perhaps in no modern device has there been such progress as in the automobile industry, and we could now look for 12 miles per hour in city service except in their most congested sections.

An automobile could carry, say, 1,000 pounds or more of mail 1 mile in five minutes, 2 miles in ten minutes, 3 miles in fifteen minutes, and so on; or if we allowed three minutes at each end of the route to get the mail in and out of the post-office, the time would be 1 mile in eleven minutes, 2 miles in sixteen minutes, or 3 miles in twenty-one minutes.

In competition the pneumatic-tube service would get the first 9 pounds of mail over the same distance as follows: One mile in two minutes, 2 miles in four minutes, 3 miles in six minutes; but for the

entire 1,000 pounds it would occupy for 1 mile thirty minutes, 2 miles thirty-two minutes, 3 miles thirty-four minutes, and would have used the entire capacity of the tube line to the exclusion of any intermediate postal stations.

The superior efficiency of the automobile would appear to begin when the weight to be dispatched at one time equaled, say, 400 pounds, or about 20,000 pieces. If the weight for dispatch at one time were 800 pounds, the ordinary mail wagon, at 6 miles per hour, would begin to show superior efficiency in moving the entire load.

When the committee of outside experts made their report in December, 1900, there were only 8.05 miles of tube line in operation, at an average cost of $27,610. The committee expressed the belief that the cost of pneumatic-tube service would be capable of very considerable reduction. This expectation was confirmed in the law of April 21, 1902, which fixed $17,000 a mile a year as the maximum in cities where over 3 miles of service were operated. The first contracts made under this law were at a lower rate, and the lowest figures were reached in 1904, when there were 15,125 miles in operation at an average rate of $14,444 per mile per year.

The committee of 1900 reported that there were no instances of inadequacy at that time, but at present Boston, New York, Chicago, and St. Louis report that there are times in the day when all of the first-class mail can not be sent through the tube. These instances are in every case mail to or from railroad depots.

In these cases it is cheaper and better to send the main load by wagon or automobile than to provide additional tube facilities for the excess. The tube should take care of the supplementary mail in these cases, and can advance it materially.

It has been customary in the past to mention as a distinguishing advantage of pneumatic-tube service the fact that it provides for a continuous stream of mail. This is an advantage when there is a continuous stream of mail in moderate quantities; but the actual experience is that mail accumulates slowly in the morning hours (except from railroad depots), while in the closing hours of the business day it accumulates very rapidly. The continuous stream is only likely to be approximated in the greatest cities, and only in the busiest portions of those cities.

The committee of 1900 described the pneumatic-tube service as an expensive service, and it appears to be so unless one bears in mind the great frequency of tube carrier trips, which are made 4 per minute, or 240 per hour. Remembering that the service costs $17,000 per mile per annum, or $8,500 one way, the rate per day per mile is about $25. We must bear in mind, however, that the hours of service are in most cases twenty hours per day, thus providing 4,800 carriers' trips through the tube. This represents a cost of only one-half cent per carrier per mile, or one-half cent in transmitting about 450 letters 1 mile. Even on sections of the tube where the service is used for only a small percentage of its capacity, as between stations J and C in Philadelphia, the cost is nevertheless slight. For example, on this section, where only 392 carriers are dispatched both ways daily, with an average of 200 pieces for each carrier, the cost would be 12 cents per carrier mile, or a charge of only about one-half a mill per letter per mile.

The constant availability of the tube service for dispatches of mail at any time is a very valuable factor toward maintaining an even circulation of mail and as assisting toward the even employment of the working force. This desirable advantage could hardly be secured by any other method.

Frequent allusion has been made by postmasters and others in regard to the freedom from interruption experienced by the tube service as compared with surface traffic in times of street blockades by parades, snowstorms, etc. This is undoubtedly true, but these instances are comparatively rare.

The extreme expectations in regard to the capacity of tube service for transmitting first-class mail have not been realized. In this respect the operating companies have also learned by experience that safety of operation requires a greater headway or interval between successive carriers through the tube than was at first thought necessary. In 1897 the interval between carriers was assumed to be six seconds, whereas to-day it varies from thirteen to fifteen seconds. It is said by the American Pneumatic Service Company that by improved methods a system could be built by which carriers could be dispatched on a headway of from four and one-half to seven seconds, or approximately twice as fast as the present service. To do this, however, would require a different type of terminal apparatus, larger power plants, and considerable more labor. In early calculations the capacity of the tube carrier was rated as 600 letters. It is possible to place 600 letters in one of the tube carriers, but in actual practice this committee has deemed it best to fix the maximum at 450 pieces, thus approving the ratio accepted by the departmental committee of 1905 in making pneumatic-tube investigation. As a result of these several modifications, our estimate of the tube capacity one way per hour is now 108,000 pieces instead of 360,000 pieces as was predicted in 1897.

APPROXIMATE COST OF PURCHASE.

The cost of purchase of the pneumatic-tube system would, of course, be the lowest price fixed by the owners and acceptable to the purchaser. The American Pneumatic Service Company have expressed their willingness to have the price fixed by agreement with representatives of the Government, or, in case of disagreement, by arbitration. They state the total cost of their system, including in part stock and bonds at par, as $7,093,557.69, and in reply to our question as to the actual cost of construction, they say that from their books it appears to be $5,526,822.43. In connection with the last-mentioned amount, the American company further explains that the Chicago, Boston, and St. Louis systems cost in excess of the actual cash cost of construction $825,451.71, which was the cost of experimentation, securing franchises, legal services, official salaries, and other corporate charges, a substantial portion of which was paid in cash and the balance in stock of the American company. They can not establish at this day the actual cash value of the stock which was issued at the date it was used, but assume that in the item of $825,451.71 the cash equivalent would be more than enough to make the actual cost of the entire system in cash or its equivalent in excess of $6,000,000. They further state that the figures just quoted take no account of the value of the patents

of the American company, which, in the opinion of competent counsel, constitute practically a complete monopoly of pneumatic-tube systems, some of these patents having cost the company a very large amount to acquire. They add, furthermore, that the figures just quoted contain no estimate of the loss of dividends on the stockholders' investment during the construction of the systems or the expected profit from the pioneer's risk.

In order to attempt an approximation of the cost of purchase in advance of any possible negotiations such as the company suggest, it seems advisable to analyze these amounts somewhat, in order to bring out the lowest minimum price that can be approximately substantiated in comparison with the price as first submitted by the company.

The pneumatic-tube system is regarded as consisting of (*a*) the equipment or physical property in the tube line, terminal machinery, etc.; (*b*) the patents; and (*c*) the franchises.

As the last two items are not so tangible as the first, it seems best to give them primary consideration.

FRANCHISES.

If the pneumatic-tube companies were disposing of their system to private parties, the franchises would certainly be deemed of value; but it may be said that the Federal Government is the one purchaser to whom the franchises would represent nothing of value; in fact, it is practically conceded by the representatives of the American Pneumatic Service Company that the Federal Government would occupy a preferential position in obtaining franchises of this character from the States or municipalities.

PATENTS.

The American Pneumatic Service Company submit a schedule of 125 patents owned or controlled by them which are used in the performance of the pneumatic-tube mail service. They say they can not determine the cost to the company of each patent; that a large number of them are inventions of skilled inventors in the employ of the company, others acquired at a very large expense from outsiders, and still others acquired in connection with the purchase of other property. The American company claims that in its territory it controls a complete monopoly of the patents essential for the performance of pneumatic-tube mail service.

A critical examination of this sweeping claim made by the company would require expert legal assistance which this committee has not had at its command, and would no doubt require a long time for examination and determination.

However, it should be mentioned that a competing company i. e., the United Store Service and Tube Company, of 921 Tremont Building, Boston, Mass., has stated to this committee, through its president, Mr. Arthur S. Temple, that it controls independent patents which would enable it to operate a pneumatic-tube mail system without regard to the American Pneumatic Service Company or the Batcheller Pneumatic Tube Company. Mr. Temple also said that his company (which was established June, 1907) was prepared to make proposals to the Government for the construction of 8-inch pneumatic-tube equipment, including all necessary terminal machinery, and had not heretofore made any such formal proposition to the

Government because the Government had not issued any advertisement calling for bids for pneumatic-tube service since the incorporation of the United Store Company. He further exhibited to the subcommittee an experimental 8-inch plant over 400 feet long, in Boston, and it operated successfully during the experimental tests that were made.

There have also appeared before the subcommittee representatives of the United States Pneumatic Company, of 74 Broadway, New York City, with a definite proposition for constructing for operation or for sale an 18-inch mail tube between the general post-office and the Union Station at Washington, D. C. They say that the terminals and carriers will be operated under patents owned and controlled by the United States Pneumatic Company. The system is operated on the vacuum principle, for which they claim certain advantages. They also express their readiness and willingness to increase or decrease the diameter of the tube, and say they are ready to bid on the construction of mail-tube systems in any city where the Government may plan to adopt pneumatic-tube service for the handling of United States mail.

We understand that there is also another company called the Universal Pneumatic Tube Company of Chicago, which has been operating a 6-foot diameter conduit in which a car carrying passengers is propelled by air pressure and vacuum in one of the pleasure parks of Chicago. We also understand that this same company has given demonstrations of pneumatic-tube service by using 16-inch and 24-inch tubes by vacuum system. No formal proposition, however, has been received by this committee from the Universal Pneumatic Tube Company.

Pneumatic tubes have been in use for a great many years both in foreign countries and in the United States, and it is believed by this committee that the process of propelling an object through a tube by air pressure or suction is common property and that no patent prevents the free use of the basic principle. The patents scheduled by the American Pneumatic Service Company appear to relate to particular patterns of bent pipes, to particular patterns of receivers and transmitters, and to particular patterns of tube carriers; and it is our opinion that many of these patents cover merely minor variations of method, and are held not so much for use as for protection against conflicting patents.

In view of all the circumstances recited above, one is not warranted in accepting without question the claim of the American Pneumatic Service Company that they control an absolute and complete monopoly of the patents necessary for the purpose of a pneumatic-tube mail service.

VALUE OF EQUIPMENT.

The cost of the equipment, consisting of the tube line proper, the terminal machinery, and the power plants must be ascertained by including not only the value of the physical property itself, but also in the case of the tube line the cost of construction, which would include trench digging, laying of pipe, repaving, etc.; and in the case of terminal machinery and power plants, the cost of placing it in position and arranging for its adjustment and connection with the tube line.

COMPANY'S AND COMMITTEE'S ESTIMATES.

The actual cost of constructing the system belonging to the American Pneumatic Service Company is stated by the company to be as follows:

New York, N. Y., and Brooklyn, N. Y	$4,534,890.02
Chicago, Ill	512,149.51
Boston, Mass	375,929.06
St. Louis, Mo	103,853.84
Total	5,526,822.43

The American company, in connection with their statement that it would cost 15 to 25 per cent more to reproduce the tube lines at the present day, was requested to submit a detailed statement, by cities, as to the cost of reproduction, and has done so by a statement of their chief engineer, Mr. B. C. Batcheller, based on the items of (*a*) station equipment, (*b*) street material, (*c*) street work, and (*d*) engineering, office, and miscellaneous expense, with the following result:

City.	Miles.	Cost.	Rate per mile.
New York and Brooklyn, N. Y	21.7284	$1,803,457.20	$83,001
Chicago, Ill	9.18	573,364.46	62,458
Boston, Mass	6.89	450,123.10	65,329
St. Louis, Mo	2.09	139,589.42	66,789
Total	39.8884	2,966,534.18	[a] 74,367

[a] Average.

One of the duties imposed upon this committee was the ascertainment of the approximate cost of installation as an alternative to the approximate cost of purchase, and in order to fulfill this duty the committee obtained estimates from contractors for street work in each of the cities, and also obtained estimates regarding the cost of pipe, terminal machinery, and power plants. Such approximate estimate has been made with due regard to the diversity of conditions encountered, and the result is believed to fairly represent the cost of the work at the present day in the cities where the service is now in operation and does not include any allowance for franchises or patents. The committee's estimate of the cost of construction, including installation, is as follows:

City.	Miles.	Cost.	Rate per mile.
New York and Brooklyn, N. Y	20.65	$1,566,557	$75,862
Chicago, Ill	7.41	364,994	49,257
Boston, Mass	6.89	447,521	64,952
St. Louis, Mo	2.09	107,464	50,989
Total	37.04	2,486,536	[a] 67,131

[a] Average.

Philadelphia, Pa.—The purchase price of the Philadelphia pneumatic-tube system is stated by the Pneumatic Transit Company to be $1,390,000, this representing, as the company says, the value of 71 patents, together with the equipment of the system, on the basis of 8.21 miles. This mileage includes a line from the general post-

office via Southwark to Station D, 1.915 miles, which went into operation on November 23, 1908, and it also includes the proposed line from general post-office to Reading Terminal, 0.2738 mile, which has not yet been built. As regards the original cost of construction, the company states the amount to be $601,730 for the 8.21 miles, and they add to this the cost of alterations and losses in operation, $108,254, making a total actual cost, according to their statement, of $709,964.

The remarks made above in alluding to the American Pneumatic Service Company in relation to the assumed value of franchises and patents would apply in like measure to the Pneumatic Transit Company.

As regards the actual cost of construction or reproduction, the estimate made by your committee is $389,174 for the 6.02 miles in operation previous to November 23, 1908. Taking the original cost of construction as stated by the company, $601,730, we find their estimate represents an average of $73,299 per mile, while the committee's estimate for 6.02 miles would represent $64,607 per mile. There should be no considerable difference between the items in the committee's estimate and the items in the company's estimate, because the major portion of the mileage in Philadelphia (6.56 miles out of a total of 8.21) has been constructed within the past year and a half.

Summary.—For convenience of reference, it is deemed well to state in tabular form in parallel columns the total cost of the pneumatic-tube systems as stated by the companies, the net cost as stated by them, the cost of reproduction of the American system as estimated by their engineer, and the approximate cost as estimated by your committee.

Approximate cost and construction (or reproduction) of the several pneumatic-tube systems as stated by companies and as estimated by committee.

City.	Total cost claimed by company.	Actual cost of construction, etc., as claimed by company.	Length.	Cost of present reproduction, company's estimate.
			Miles.	
New York and Brooklyn, N. Y.	$5,276,173.57	$4,534,890.02	21.72	$1,803,457.20
Chicago, Ill.	1,036,154.64	512,149.51	9.18	573,364.46
Boston, Mass.	510,076.77	375,929.06	6.89	450,123.10
St. Louis, Mo.	271,152.71	103,853.84	2.09	139,589.42
Total.	7,093,557.69	5,526,822.43	39.88	2,966,534.18
Philadelphia, Pa.	1,390,000.00	[a] 601,730.00	8.21	
Total.	8,483,557.69	6,128,552.43	48.09	

City.	Length.	Cost of construction committee.	Rate per mile for reproduction.	
			Company.	Committee.
	Miles.			
New York and Brooklyn, N. Y.	20.65	$1,566,557.00	$83,001.00	$75,862.00
Chicago, Ill.	[b] 7.41	364,994.00	62,458.00	49,257.00
Boston, Mass.	6.89	447,521.00	65,329.00	64,952.00
St. Louis, Mo.	2.09	107,464.00	66,789.00	50,989.00
Total.	37.04	2,486,536.00	[c] 74,367.00	[c] 67,131.00
Philadelphia, Pa.	6.02	389,174.00	73,292.00	64,647.00
Total.	43.06	2,875,710.00		[c] 66,783.00

[a] This does not include alterations and losses in operation, $108,254.
[b] This does not include the general post-office and Kinzie Station line, 1.77 miles, not in operation.
[c] Average.

DEPRECIATION.

Aside from the items that have already been dealt with under the heading "Approximate cost of purchase," it would be appropriate in any negotiations that were conducted with the view of purchase to deal with the question of depreciation of equipment since its original installation. This is difficult to estimate, but the testimony received by the committee would indicate the propriety of an allowance of from 3 to 5 per cent per annum for depreciation of tube line, and from 5 to 10 per cent per annum for depreciation of machinery. This would have a very material bearing upon the value of the present equipment, a half mile of which has been in use as long as fifteen years and 8 miles for about eleven years.

APPROXIMATE COST OF INSTALLATION.

The approximate cost of installation as called for in the congressional inquiry is fairly well represented by the estimate of the committee quoted above, viz, $2,875,710 for a total of 43.06 miles plus the cost of the new line just opened in Philadelphia (1.915 miles), $123,819, making a total of $2,999,529 for 44.975 miles of service now in operation.

COST OF MAINTENANCE AND OPERATION.

The committee has found it extremely difficult to compute satisfactorily the cost of maintenance and operation. The natural process would be to obtain an itemized statement from the contracting companies to cover the average cost of maintenance and operation for several years, and, after verifying as far as possible the several items, compute the modifications which might be allowable on each item of governmental ownership or operation.

The statements in this respect submitted by the companies do not cover more than one year and are not uniform as regards the items included. In some cases depreciation is accounted for, but merely as an estimate, the contracting companies allowing a 5 per cent annual charge for this account in Boston, Chicago, and St. Louis, but omitting any estimate regarding depreciation in New York and Brooklyn. In Philadelphia the operating company makes a charge of 3 per cent for depreciation.

In the companies' statements regarding the cost of maintenance and operation no charge is made to cover the item of taxes or the item of interest on the investment.

The item of repairs is subject to great fluctuation, there being conditions arising in certain years that might lead to very heavy outlays, and yet be at the same time of special character not likely to be encountered in another year. This would include such cases as the necessary reconstruction in Boston on account of the municipality building subways; or the instance in Chicago where the street railway tunnel under the river was blown up by the War Department; or still other cases, where the brass bends in the earlier construction soon wore out and had to be replaced by cast-iron bends.

Another unusual and sometimes heavy item of expense is caused by the obligation which the contracting companies have of changing the line of the tube to conform to changes made by the Post-Office Department in the location of postal stations. There have been two changes

of this character in Philadelphia, two changes in Chicago, and five changes in New York City.

A heavy item which would naturally be placed under the head of operation expenses is the renewal (including repairs) to tube carriers. These carriers, although made of steel, have a comparatively short life, as they are not expected to cover more than 10,000 miles before the bearing rings are worn down and must be replaced, and after two replacements of rings the carrier as a rule is not fit for further use. The carriers therefore go out of use after about two years' employment, and it seems fair to charge in this case about 50 per cent for depreciation, and in addition thereto a further charge for repairs. Such replacement of equipment might be charged to maintenance or might be charged to capital account; but being so directly the result of operation, we would naturally classify it under that head. The importance of this item may be appreciated when it is understood that the several systems use altogether about 3,700 tube carriers, which, at the rate of $20 apiece, would represent a total investment of almost $75,000. The many experiments that have been made by the companies' engineers with the view of increasing the durability and security of the carrier are to a great extent represented in the variety of carriers that are now in use in the several cities. An acceptable standard of carrier is still to be developed in which will be found the highest degree of durability and security coupled with interchangeability as between one tube line and another, and in addition to this an easily operated fastening for the cover, and a method of legible labeling.

COST OF ONE YEAR'S OPERATION.

The statements submitted by the operating companies have been tabulated in comparison with the mileage used in the systems, and the result for one year is shown in the following table:

Cost of maintenance and operation of pneumatic-tube systems according to companies' statements for year ended March 31, 1908.

	Boston.	New York and Brooklyn.	Chicago.	St. Louis.	Philadelphia.[a]
Mileage used in estimate	6.89	7.00	7.41	2.09	6.02
Postal stations	8	8	7	3	7
Terminal machines	13	11	11	4	12
Power plants	9	10	7	2	17
Tube carriers	945	1,000	1,050	195	476
Hours of operation (week days)	20	[b] 19	[c] 20	20	[d] 20
General expenses	$6,235.89	$18,027.42	$11,451.38	$6,643.67	$6,577.46
Operation, including all repairs	42,119.44	37,000.36	42,669.36	12,808.32	31,289.52
Power	26,662.33	54,245.71	26,240.18	4,952.76	21,356.50
Depreciation (5 per cent)	18,796.45	[e]	25,607.47	5,192.69	[f] 21,299.52
Taxes and interest	[e]	[e]	[e]	[e]	[e]
Total	93,814.11	109,273.49	105,968.39	29,597.44	80,523.00
Cost per mile	13,615.98	15,610.49	14,300.12	14,161.45	13,375.91

[a] This is based on six months' figures—January 1 to June 30, 1908. (Depreciation 3 per cent.) The expense of maintaining and repairing carriers is estimated at $20 per year as compared with $14 in other cities, principally because of the smaller number of carriers employed.

[b] New York general post-office to Station P, seventeen and one-half hours.

[c] Illinois Central depot to Stock Yards, thirteen hours.

[d] Philadelphia general post-office to Bourse, nine hours.

[e] Not stated.

[f] 3 per cent.

Inasmuch as the items of depreciation, taxes, and interest are not uniformly stated, it will be helpful to concentrate our attention upon the items of operation (including all repairs), power, and general expenses. These items are shown in the following table, reduced to the average mile in each city, and the ratio which each of these items bears to the total outlay for the three items combined is indicated at the foot of the table.

Cost of maintenance and operation per mile per annum according to companies' statements for the year ended March 31, 1908, excluding taxes, interest, and depreciation.

	Boston.	New York and Brooklyn.	Chicago.	St. Louis.	Philadelphia.
Operation, including all repairs	$6,258.26	$5,285.77	$5,758.35	$6,128.40	$5,197.59
Power	3,869.71	7,749.40	3,541.18	2,369.71	3,547.59
General expenses	905.06	2,575.34	1,545.34	3,178.75	1,092.60
Total	11,033.03	15,610.51	10,844.87	11,676.86	9,837.78
The items as stated are in the following ratio:	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Operation, including all repairs	56.7	33.8	53.0	52.4	52.8
Power	35.3	49.6	32.7	20.3	36.1
General expenses	8.2	16.4	14.2	27.2	11.1

It will be noted in studying the percentages quoted above that there is a close correspondence in regard to the cost of operation, including repairs, in all of the cities except New York, the average ranging from only 52.4 per cent to 56.7 per cent; in New York the percentage is 33.8, and we are unable to account for the difference, and feel obliged to assume that it is probably to be explained by the system of bookkeeping rather than by any actual lower rate of operation or repairs. The cost of this item in New York would naturally be somewhat greater than in other cities because of the higher price of labor and more active use of the system, and probably greater difficulty in making repairs.

In the item of power there is close correspondence between the percentage in Boston, Chicago, and Philadelphia, i. e., 35.3, 32.7, and 36.1 per cent, while the cost of power in New York is represented by 49.6 per cent. We have inquired into this, thinking at first there might be a clerical error on the part of the company in stating the amount in New York. This does not appear to be the case, but there is evidently an excessively heavy charge for steam power purchased at the Madison Square Branch, the charge there ($29,000) being, we believe, from 30 to 50 per cent too high. The low percentage of cost of power at St. Louis (20.3 per cent) is explained by the fact that all the power there is steam power purchased at cost from the Government.

In the item of general expenses the operating companies have not undertaken any analysis, and while we would naturally expect a similarity in the amount charged for inspection and supervision in cities having about 7 miles of service, there are other incidental items which might vary greatly, such as taxes and percentages to municipalities, salaries, legal expenses, etc. In the case of St. Louis the ratio of general expenses is extremely high (27.2 per cent).

This can be partly accounted for by the small mileage operated (company estimate, 2.09 miles; department estimate, 1.85 miles). It is also explained in part by an item of legal expenses, $2,500, during the year ending March 31, 1908, this single amount representing over 37 per cent of all general expenses in that city.

ANALYSIS OF OPERATING EXPENSES BY SYSTEMS.

We have attempted an analysis of the item "Operating expenses, including all repairs," on the basis of information received from several sources. It is said, for instance, that tube carriers are entirely worn out and unfit for further use at the end of about two years, and some testimony has even fixed one year as representing the full life of the carrier. They will usually stand new bearing rings twice during this time, and other repairs have been approximated so that it seemed entirely fair to fix an expense per annum of $14 per carrier in all of the cities except Philadelphia, and in that city $20 per annum, in view principally of the smaller number of carriers employed.

The expense of operating labor has been fairly well approximated by detailed reports from postmasters as to the number of men employed and their wages. The result is shown in the following table, by systems:

Detailed items.	Boston.	New York and Brooklyn.	Chicago.	St. Louis.	Philadelphia.
Miles used in estimate	6.89	7.00	7.41	2.09	6.02
Operators at terminals	$17,482.00	$20,984.00	$16,432.00	$4,024.00	$12,060.00
Carrier repairs and renewals	13,230.00	14,000.00	14,700.00	2,730.00	9,520.00
Repairs, tube and machinery	11,407.44	2,016.36	11,537.36	6,054.32	9,709.52
Total operation, including all repairs	42,119.44	37,000.36	42,669.36	12,808.32	31,289.52
Power	26,662.33	54,245.71	26,240.18	4,952.76	21,356.50
General expenses	6,235.89	18,027.42	11,451.38	6,643.67	6,577.46

In order to provide a closer comparison upon a somewhat even basis, these amounts have been further reduced to the rate per mile as exhibited in the following table:

Detailed items.	Boston.	New York and Brooklyn.	Chicago.	St. Louis.	Philadelphia.
Miles used in estimate	6.89	7.00	7.41	2.09	6.02
Operators at terminals	$2,537	$2,997	$2,217	$1,925	$2,003
Carrier repairs and renewals	1,920	2,000	1,983	1,306	1,581
Repairs, tube and machinery	1,656	289	1,558	2,396	1,613
Total operation, including all repairs	6,113	5,286	5,758	6,127	5,197
Power	3,869	7,749	3,541	2,371	3,547
General expenses	905	2,575	1,545	3,178	1,093
Total per mile	10,887	15,610	10,844	11,676	9,837

A further and even more helpful illustration is produced by working out these amounts in their percentage relation to the maximum pay allowed by law per mile—$17,000 per annum.

Ratio of operating expenses to maximum pay of $17,000 per mile per year.

Detailed items.	Boston.	New York and Brooklyn.	Chicago.	St. Louis.	Philadelphia.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Operators	14.92	17.63	13.04	11.32	11.78
Carrier repairs and renewals	11.29	11.76	11.67	7.68	9.18
Repairs, tube and machinery	9.73	1.7	9.16	17.04	9.48
Total	35.94	31.09	33.87	36.04	30.44
Power	22.76	45.58	20.83	13.94	20.86
General expenses	5.32	15.15	9.09	18.69	6.42
Total operation per mile (including repairs)	64.02	91.82	63.79	68.67	57.72

A little study of this table convinces one that the average of operating expenses, including power and general expenses, are best represented in the figures for Boston and Chicago so far as the American Pneumatic Service Company's system is concerned, and in order to establish a general average, it is deemed fitting to combine with these two cities the figures furnished from Philadelphia, where the operation is in charge of the Pneumatic Transit Company.

The average of the several items in these three cities is shown to be as follows:

Boston, Chicago, and Philadelphia combined.

	Per cent.	Rate per mile.
Operators	13.25	$2,252
Tube carriers	10.71	1,828
Repairs, tube line and machinery	9.46	1,609
Power	21.48	3,653
General expenses	6.94	1,183
Total	61.84	10,525
Leaving balance for taxes, depreciation, and interest	38.16	6,475
Total	100.00	17,000

We believe that this average of $10,525 per mile (exclusive of taxes, depreciation, and interest) would fairly represent the average cost of performing the service in all of the cities (Boston, Chicago, Philadelphia, and St. Louis), but we do not think it would be practicable to apply this same average to New York and Brooklyn in combination. In that case (after careful consideration) we are inclined to make an allowance of 33 per cent increase for operating labor on account of the busier character of the line and the probable higher rate of wages; 10 per cent additional for the cost of repairing and renewing tube carriers on account of more active use of the line; 10 per cent increase for the cost of repairs to tube line and machinery, for the reason just given and also because of the greater extent of the congested district than in other cities; 25 per cent more for power on account of the more active use of the line, and probably higher cost

of fuel; and 10 per cent increase in general expenses, mainly on account of the higher wages for inspectors and supervisors. The result of these allowances would make the calculation for New York and Brooklyn combined as follows:

	Average cost per mile.	Increase.	New York rate.
		Per cent.	
Operators	$2,252	33	$3,003
Tube carriers	1,828	10	2,010
Repairs, tube line and machinery	1,609	10	1,770
Power	3,653	25	4,566
General expenses	1,183	10	1,301
Total	10,525	[a] 20	12,650

[a] Estimated average.

The cost of operation, including the items above specified in New York ($12,650), would represent 74.4 per cent of the annual rate of pay ($17,000), thus leaving 25.6 per cent, or about $4,350, as a balance to cover taxes, depreciation, and interest.

ANNUAL COST OF MAINTENANCE AND OPERATION UNDER GOVERNMENTAL OWNERSHIP.

In dealing with this phase of the matter we have assumed that the General Government would be entirely relieved of any charges for taxes (state or municipal), or percentages, or other license fees. In regard to interest upon the capital invested, it would seem somewhat questionable as to whether any charge of this kind should be made, inasmuch as the revenues of the Government are raised from taxation, and it is seldom that bonds are issued and sold for specific outlays. However, in the following table we have restated the committee's estimate of the approximate cost of constructing the tube line and machinery, so that if it be desired to make a charge of this kind it can be very readily done.

Under the head of "Depreciation" we have assumed an annual charge of 3 per cent on the tube line and an annual charge of 8 per cent on the machinery; but inasmuch as the depreciation is calculated upon the approximate cost of a new line and of new machinery, it is made conditional that the companies should first make good the accrued depreciation. If this were not done, it would be necessary to increase the rate for the first years of governmental operation to include this additional amount.

Inasmuch, however, as the costs of the pneumatic-tube systems, as stated by the companies, both as to actual expenditure and as to total cost, are far in excess of the committee's calculations, we have extended the cost of operation under both of these heads by charging an annual rate of 3 per cent, so as to show the effect upon the annual cost of operation by the Government if a purchase were made at either of the amounts stated by the companies.

Estimated annual cost of maintenance and operation per mile under governmental ownership.

[Depreciation and interest computed upon both committee's and companies' figures in comparison.]

Item.	Boston.	New York and Brooklyn.	Chicago.	St. Louis.	Philadelphia.
Mileage used in estimates:					
Committee's estimate	6.89	20.65	7.41	2.09	6.02
Company's estimate	6.89	21.72	9.18	2.09	8.21
1. Committee's estimate:					
Construction cost per mile of tube line	$42,609	$53,474	$33,422	$32,735	$31,132
Machinery	16,438	15,006	11,382	14,439	27,637
Total	59,047	68,480	44,804	47,174	58,769
2. Company's statement (actual cost per mile in cash or its equivalent)	54,561	208,788	55,790	49,690	73,292
3. Company's statement (total cost per mile on books, rating stock at par)	74,030	242,871	112,871	129,713	169,306
4. Operation (estimated cost per mile per year, including power, repairs, general expenses)	10,525	12,650	10,525	10,525	10,525
5. Allowance for increased wages, shorter hours, etc., under government ownership, i. e., 20 per cent on cost of operators	507	595	442	385	400
Total operating cost	11,032	13,249	10,967	10,910	10,925
Depreciation, committee's estimate:					
3 per cent on tube line	1,278	1,502	1,002	981	933
8 per cent on machinery	1,314	1,200	910	1,154	2,210
6. Total cost of operation, including future cost of depreciation, and conditioned upon the companies first making good the accrued depreciation	13,624	15,951	12,879	13,045	14,068
Add 3 per cent interest on excess of item No. 2 over item No. 1	13,624	20,160	13,209	13,120	14,504
Add 3 per cent interest on excess of item No. 3 over item No. 1	14,073	21,183	14,941	15,521	17,384

PROBABLE RELATIONS BETWEEN GENERAL GOVERNMENT AND MUNICIPALITIES.

In September letters were addressed to the mayors of Boston, New York, Philadelphia, Chicago, and St. Louis to elicit opinions from the mayor and the city counsel as to the relations that would exist between the municipal and the Federal Government in the event of the latter owning and operating the pneumatic-tube systems.

Replies have been received from all except Philadelphia. The replies are transmitted with this report. The opinions, as expressed, reveal no obstacle or difficulty in connection with the matter. It is suggested that if the Government sought to open the streets and lay tubes, it should be by formal license from the municipality and subject to reasonable restrictions in the nature of police regulations. There is no suggestion that there would be any propriety in levying charges for such privileges if the Federal Government acts in its own person and not through contractors or private corporations. The opinion of the mayor of New York is especially cooperative and he tenders his assistance in every way to secure any requisite state or municipal legislation, believing it to be of the greatest importance that the citizens of New York should have the latest and most modern appliances to facilitate the transmission of the mail.

TUNNELS AND SUBWAYS.

In accordance with the personal suggestion of the Postmaster-General, particular inquiry was made to ascertain if it would be feasible to use tunnels and subways already existing, or to be constructed by municipalities for passenger or freight traffic, so as to reduce the expense of installing pneumatic tubes in the future. It appears, however, that there is little if any opportunity for action in this direction in any of the cities. In Boston the tubes are already laid in the sections where the passenger subways are built. In New York, where it appeared most probable that such opportunities could be found, it was learned from the public service commission that the only pipe gallery existing is a short one in connection with the Delancey Street Bridge. This would not fit in with any present scheme of pneumatic-tube extension. It is understood that there is a possibility in New York of laying tubes in the arches of the present passenger subways, but this would be subject to the consent of the Interborough Rapid Transit Company (the operating company) and the approval of the municipal board of estimate and apportionment, and no doubt the Interborough Company would expect adequate compensation. In this connection it must be remembered that the difficulty of laying tubes and subsequently of repairing them would be extremely great in view of the almost constant traffic through the tunnels, leaving very few and very short intervals even at night or on Sundays for work of this character.

DOCUMENTS, PAPERS, ETC.

Accompanying this report we transmit all papers in any way essential for further consideration of the subject, these including detailed statements of postal statistics for each of the cities, testimony from persons having useful information, the responses from the mayors of the municipalities affected, and the responses from the pneumatic-tube companies.

Respectfully submitted.

SUBCOMMITTEE.

JOSEPH STEWART,
Second Assistant Postmaster-General, Chairman.
V. J. BRADLEY,
Superintendent Railway Mail Service.
E. M. NORRIS,
Assistant Superintendent, Division of Salaries and Allowances.
J. M. MASTEN,
Assistant Superintendent Railway Mail Service.

Table of postal stations now connected by pneumatic tubes, including distances, time in transit, speed, and frequency of service.

BOSTON, MASS.

City and termini.	Distance.	Contract time in transit by—			Speed per hour by—			Frequency of trips both ways by—						Tube carriers dispatched week days.
		Tube.	Wagon.	Other means.	Tube.	Wagon.	Other means.	Tube.		Wagon.		Other means.		
								Week days.	Sundays.	Week days.	Sundays.	Week days.	Sundays.	
		m. s.	*m.*	*m. s.*	*Miles.*	*Miles.*	*Miles.*							
General post-office to North Postal Station	0.875	1 45	12	.....	30	3.66	.....	467	.....	80	27	.....	.....	1,966
General post-office to South Station	.645	1 17	10	.....	30	2.33	.....	474	.....	92	40	.....	.....	2,907
South Station to Essex Street Station	.560	1 7	5	.....	30	4.00	.....	51	.....	4	6	.....	.....	810
Essex Street Station to Station A	1.240	2 30	.....	.....	30	.....	.....	44	.....	.....	.....	.....	.....	610
Station A to Roxbury Station	1.070	2 8	.....	5 10	30	.....	6	44	.....	.....	.....	8	3	400
Roxbury Station to Uphams Corners	1.420	2 48	.....	30 40	30	.....	6	29	.....	.....	.....	2	2	217
Essex Street Station to Back Bay Station	1.080	2 10	.....	.....	30	.....	.....	51	.....	.....	.....	.....	.....	506

NEW YORK AND BROOKLYN, N. Y.

	Miles.	*m. s.*	*m.*	*m.*	*Miles.*	*Miles.*	*Miles.*							
General post-office to Wall street	0.60	1 12	12	.....	24.6	3	.....	172	(a)	18	9	.....	.....	1,857
Wall street to Station P	.46	2 7	8	.....	22.8	3	.....	172	(a)	18	9	.....	.....	1,457
General post-office to Station D	1.70	3 24	23	.....	28.1	5	.....	1,642	(a)	36	17	.....	.....	6,021
Station D to Madison square	1.03	2 4	10	.....	30	5	.....	1,642	(a)	36	17	.....	.....	5,869
Madison square to Station F	.59	1 11	8	.....	30	5	.....	1,642	(a)	36	17	.....	.....	5,262
Station F to Station H	1.09	2 11	9	.....	30.5	5	.....	1,642	(a)	36	17	.....	.....	4,262
General post-office to Station V	.80	1 36	9	.....	24	5	.....	409	(a)	79	23	.....	.....	4,173
Station V to Station A	.55	1 6	8	.....	30	5	.....	409	(a)	61	14	.....	.....	4,195
Station A to Station O	1.13	2 16	12	.....	30	5	.....	409	(a)	4	4	.....	.....	3,007
Station O to Station E	1.17	2 20	10	23	30	5	6	409	(a)	79	23	.....	.....	1,981
Station E to Times square	1.13	2 16	7	.....	30	5	.....	409	(a)	79	23	.....	.....	1,368
Times square to Station G	1.17	2 20	.....	.....	30	5	.....	409	(a)	.....	.....	.....	.....	1,075
Station N to Station G	1.43	2 52	13	22	30	5	4	409	.....	22	14	64	11	1,056
Station W to Station N	.96	1 55	11	20	30	5	3	409	.....	22	14	64	11	1,084
Station W to Station J	2.62	5 15	26	23	30	5	8	409	.....	22	14	64	11	1,139
Station J to Station L	.95	1 54	.....	14	30	.....	5	409	.....	.....	.....	.....	.....	643
General post-office to Hudson Terminal	.42	51	4	.....	25.1	3	.....	2,659	.....	48	34	.....	.....	4,295
New York to Brooklyn	1.65	3 15	20	.....	29.91	4.86	.....	436	68	47	32	.....	.....	1,263
Brooklyn to Station L	1.35	2 40	15	10	33.73	5.40	8	187	20	26	1	13	8	517

a Not reported.

PHILADELPHIA, PA.

	Miles.	m.	s.	m.	m.	Miles.	Miles.	Miles.							
General post-office to Broad street	0.72	1	26	8	6	28.8	5.4	7.2	348	(a)	132	66	28	12	3,171
Broad street to Station J	1.23	2	30	.....	10	29.5	.....	7.3	280	(a)	.....	.....	9	5	641
Station J to Station C	.88	1	36	.....	7	37.	.....	7.2	197	(a)	.....	.....	9	5	392
General post-office to Station S	1.41	3	10	.....	8	26.6	.....	8.1	244	(a)	.....	.....	20	11	802
Station S to Station O	1.21	2	20	.....	.....	31	.....	.....	166	(a)	.....	.....	.....	.....	522
General post-office to Bourse	.56	1	8	7	.....	29.5	4.8	.....	140	.....	30	.....	.....	.....	747

CHICAGO, ILL.

	Miles.	m.	s.	m.	m.	Miles.	Miles.	Miles.							
General post-office to La Salle	0.55	1	16	10	.....	30	5	.....	91	18	70	48	.....	.....	3,826
La Salle to Station U	.82	1	38	15	.....	30	5	.....	100	23	28	9	.....	.....	2,592
General post-office to Illinois Central	1.27	2	32	20	.....	30	5	.....	90	25	59	36	.....	.....	1,927
Illinois Central to Twenty-second street station	1.02	2	2	.....	12	30	.....	5	46	14	.....	.....	30	6	659
Twenty-second street station to Armour station	1.02	2	2	.....	6	30	.....	10	46	14	.....	.....	30	6	641
Armour station to Stock Yards	2.73	5	27	.....	27	30	.....	10	46	14	.....	.....	30	6	379

ST. LOUIS, MO.

	Miles.	m.	s.	m.	m.	Miles.	Miles.	Miles.							
General post-office to Annex	1.30	3	3	15	.....	28.62	4.72	.....	(a)	(a)	82	33	.....	.....	1,863
General post-office to Bridge	.55	1	6	8	.....	32.7	4.5	.....	(a)	(a)	2	1	.....	.....	179

(a) Not reported.

Statistics of general post-office and postal

[Daily average, on basis of 6 week days.]

BOSTON, MASS.

Postal stations.	Population.	Postage receipts for year ended June 30, 1908.	Clerks.	Carriers.	Collections daily.	First-class mail handled daily from—		Deliveries daily.
						Collections.	Drops.	
						Pieces.	*Pieces.*	
Central post-office	223,200	$2,855,530.00	764	218	18	271,117	361,721	4–5–7
North Station	38,000	171,163.00	62	28	17	21,466	11,944	4–6
South Station			40	3	20	25,083		
Essex Street Station	100,000	374,466.00	49	45	20	66,125	38,328	4–7
Station A	65,000	144,411.00	23	51	12	24,395	2,080	4
Roxbury Station	70,000	93,217.00	21	56	9	22,600	2,550	4
Uphams Corner	34,000	37,001.00	9	30	7	6,523	1,191	4
Back Bay Station	40,000	192,378.00	29	38	11	41,182	32,102	6–5
Total	570,200	3,868,166.00	997	469		478,491	449,916	
Total whole city	1,040,400	5,348,264.00	1,480	1,230		655,079	508,778	

NEW YORK, N. Y.

						Pieces.	*Pieces.*	
Station A	155,211	$524,445.38	51	57	24	71,479	25,015	9
D	300,000	668,372.23	72	86	32	84,391	64,765	7
E	224,680	805,225.16	80	123	28	90,395	60,385	7
F	150,500	248,157.86	34	79	24	54,368	12,830	7
G	188,500	325,692.66	50	99	15	40,782	12,824	8
O	47,000	1,094,356.58	87	64	32	63,083	66,700	7
P	160,000	697,010.42	72	97	30	127,667	54,443	8
V	86,713	358,003.70	45	43	33	41,444	26,808	9
Madison Square station	67,060	1,148,608.29	80	65	32	94,433	66,294	7
Times Square station	178,375	233,303.47	35	104	28	58,915	20,463	8
Wall Street station	120,000	1,280,109.11	67	91	28	68,919	52,051	8
Station H:								
City	242,000	657,294.30	74	100	24	83,962	79,346	8
Distribution		825,515.04	387					
General post-office:								
City, regular	379,247	6,255,816.29	422	228	27	23,304	49,127	8
Distribution						18,846	198,593	
Total	2,299,286	15,121,910.49	1,556	1,236		921,988	789,644	
Total whole city	5,432,751	18,249,598.84	2,779	2,440		1,825,430	1,369,270	

NEW YORK, N. Y.

						Pieces.	*Pieces.*	
Station C	140,000	$225,292.22	24	41	16	26,959	48,057	6
I	120,000	204,111.68	31	93	16	77,464	6,109	8
J	270,000	243,598.73	34	112	16	43,328	13,620	8
K	199,000	147,490.35	24	67	16	20,235	2,171	8
L	211,000	190,449.28	25	59	16	23,840	13,470	8
N	84,000	177,938.60	29	62	16	27,599	16,228	8
S	165,175	584,241.74	58	57	28	78,954	17,170	8
U	300,421	124,010.29	23	59	16	27,948	3,439	8
W	98,000	149,224.70	31	73	16	29,058	11,889	8
Y	238,200	192,028.10	34	87	16	38,522	7,628	8
Foreign station	51,775	20,839.69	226	9			2,394	6
Hudson terminal:								
City			46	23	37			
Distribution			413			319,378	363,544	
Total	1,877,571	2,259,225.38	998	742		713,285	505,719	

stations now connected by pneumatic tubes.

[Daily average, on basis of 6 week days.]

BOSTON, MASS.

First-class mail delivered daily.	Special-delivery mail handled during year ended June 30, 1908.		First-class mail dispatched daily by—		Dispatched by tube actually advanced over other means.	First-class mail received daily [a] by—		Received by tube actually advanced in delivery.	First-class mail originating in district for delivery in same city.
	Dispatched.	Delivered.	Tube.	Other means.		Tube.	Other means.		
Pieces.	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*
286,793	[a] 92,984	162,814	368,766	251,936	.....	239,880	235,584	.....	156,284
18,154	[a] 15,620	12,752	455,960	374,774	.....	280,420	653,838	.....	10,454
.....	[a] 12,480	.....	221,201	4,800	.....	367,583	35,618	.....	[a] 8,500
76,583	37,563	27,451	82,821	3,193	.....	58,486	9,696	.....	29,357
29,446	23,824	35,030	26,750	913	.....	26,740	6,512	.....	9,890
30,900	22,404	19,250	46,250	1,730	.....	59,500	1,800	.....	11,900
11,196	1,666	4,582	22,623	1,583	.....	15,077	2,864	.....	1,632
42,496	16,846	14,001	58,976	12,105	.....	65,418	13,833	.....	14,446
495,568	223,387	275,880	1,283,347	651,034	.....	1,113,104	959,745	.....	242,463
1,045,025	[a] 430,000	476,457	1,283,347	750,000	.....	1,113,104	1,025,000	.....	[a] 350,000

NEW YORK, N. Y.

Pieces.	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*
138,594	21,493	33,603	67,464	22,489	45,121	80,000	53,900	12,800	23,878
115,117	53,827	44,179	108,958	30,699	4,358	85,565	29,412	2,567	66,966
157,293	131,000	130,135	55,905	83,670	16,362	95,358	59,495	2,721	51,629
104,065	36,240	52,274	61,988	5,210	12,398	83,957	11,055	14,300	28,167
93,455	46,464	77,368	21,558	29,598	4,306	42,589	53,709	8,509	25,208
129,126	39,420	67,876	64,964	54,621	2,010	87,934	28,278	3,357	34,280
178,738	82,895	66,880	155,319	26,862	113,051	142,623	25,694	72,698	41,902
67,847	15,648	22,794	35,962	26,504	32,383	38,235	19,762	9,558	11,375
158,158	141,080	51,540	151,144	14,670	7,558	100,663	19,796	5,033	41,796
110,805	29,260	47,768	32,139	40,879	10,550	52,380	58,343	14,735	40,472
105,856	170,922	77,722	105,020	15,950	58,523	77,960	22,545	15,415	36,246
179,390	88,764	71,196	86,636	100,119	17,035	140,361	110,661	25,526	39,349
.....	237,654	.....	422,125	737,870	9,983	344,349	898,899	.....	.....
654,534	.....	172,936	301,058	516,484	136,989	250,628	737,710	106,865	56,001
.....	.....	.....	647,330	1,062,485	35,016	879,497	293,982	.....	.....
2,192,978	1,094,667	916,271	2,317,570	2,768,110	505,643	2,502,099	2,423,241	294,084	497,269
3,114,311	1,513,303	1,553,797	2,317,570	5,137,823	505,643	2,502,099	4,132,577	294,084	953,839

NEW YORK, N. Y.

Pieces.	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*
35,226	15,877	29,684	.....	75,016	.....	.....	33,624	.....	7,670
69,488	14,406	69,001	.....	82,007	.....	.....	75,647	.....	43,056
62,614	36,088	60,916	.....	51,035	.....	.....	63,435	.....	30,410
40,518	231	533	.....	61,387	.....	.....	40,557	.....	13,329
36,824	20,875	21,072	.....	138,460	.....	.....	142,280	.....	18,460
71,994	58,572	46,645	.....	39,094	.....	.....	62,552	.....	19,003
95,233	55,988	36,844	.....	95,575	.....	.....	89,658	.....	26,362
37,563	12,493	22,726	.....	26,031	.....	.....	31,905	.....	13,951
62,904	48,571	54,510	.....	36,924	.....	.....	56,300	.....	23,681
91,193	31,507	34,796	.....	42,789	.....	.....	83,400	.....	27,650
8,398	988	6,099	.....	224,192	.....	.....	214,576	.....	820
.....	.....	.....	.....	116,536	.....	.....	.....	.....	116,536
.....	.....	.....	.....	1,136,803	.....	.....	550,687	.....	.....
611,955	295,596	383,426	.....	2,125,849	.....	.....	1,444,681	.....	340,928

[a] Estimated.

Statistics of general post-office and postal

BROOKLYN, N. Y.

Postal stations.	Population.	Postage receipts for year ended June 30, 1908.	Clerks.	Carriers.	Collections daily.	First-class mail handled daily from—		Deliveries daily.
						Collections.	Drops.	
						Pieces.	*Pieces.*	
General post-office to New York	305,000	$813,156.43	262	185	11	75,991	36,033	5
General post-office to Station L	47,465	146,765.14	17	40	9	14,312	4,164	5
Total (general post-office and L)	352,465	959,921.57	279	225	.....	90,303	40,197	.....
Tributary stations to Station L (9 in number)	343,116	411,037.59	67	259	.....	84,429	14,740	3–5
Total whole city	1,622,000	2,397,590.44	490	1,022	7–10	335,972	86,127	.....

PHILADELPHIA, PA.

						Pieces.	*Pieces.*	
Central post-office	196,691	$1,381,971.77	303	237	18	190,800	281,066	7
Broad Street Station	.....	.....	.....	.....	.....	130,500	17,650	.....
Reading Terminal Station	.....	.....	.....	.....	.....	19,400	9,720	.....
Station D	142,896	89,876.44	15	65	10	37,370	5,126	5
O	85,000	101,963.66	21	52	14	32,464	5,897	5
J	62,583	96,705.05	15	38	12	21,560	5,840	5
C	186,327	155,794.27	18	64	10	41,862	3,567	5
S	96,000	197,281.67	24	55	13	33,600	2,150	5
Southwark Station	161,597	107,325.11	13	49	10	17,820	1,170	5
Bourse Station	.....	1,109,457.42	12	19	12	104,528	11,472	8
Total	931,094	3,240,375.39	421	579	.....	629,904	343,658	.....
Total whole city	1,835,872	5,922,791.92	1,115	1,187	.....	880,795	408,279	.....

CHICAGO, ILL.

						Pieces.	*Pieces.*	
General post-office	(a)	$7,648,481.33	1,189	.....	(a)	1,069,539	223,344	.....
Central Station	300,000	(b)	602	233	27	(b)	(b)	932
Station U	165,000	454,413.24	169	84	20	160,101	22,033	319
Kinzie Station	95,000	150,649.18	64	57	20	95,386	15,036	196
Carpenter Street Station	235,095	474,875.10	17	52	12	.....	3,037	165
Station C	75,000	179,259.46	16	42	12	1,613	817	135
Station D	119,516	156,829.96	18	58	12	.....	3,500	187
Pilsen Station	195,000	155,698.71	19	56	12	.....	2,280	185
Douglas Park Station	64,000	57,641.99	10	26	12	413	4,205	80
Stock Yards Station	100,500	432,261.16	22	42	10	29,804	7,211	107
Twenty-second Street Station	54,000	138,521.12	17	29	12	6,234	3,406	96
Armour Station	116,685	122,601.88	18	55	12	13,374	6,677	138
Total	1,519,796	9,951,233.13	2,161	734	.....	1,376,464	291,546	.....
Total whole city	2,500,000	14,598,991.01	3,112	1,469	.....	1,376,464	426,021	.....

ST. LOUIS, MO.

						Pieces.	*Pieces.*	
General post-office	90,798	$2,001,728.83	498	74	24	282,329	122,357	6
Annex station	22,086	27,379.98	52	18	24	85,062	3,055	4
Bridge station	23,313	207,039.46	4	19	24	21,761	7,254	6
Total	136,197	2,236,148.27	554	111	.....	389,152	132,666	.....
Total whole city	772,912	3,897,912.12	838	636	.....	389,152	132,666	.....

[a] See Central Station.

[b] See general post-office.

NOTE.—Daily average on basis of 6 week days.

stations now connected by pneumatic tubes—Continued.

BROOKLYN, N. Y.

First-class mail delivered daily.	Special-delivery mail handled during year ended June 30, 1908.		First-class mail dispatched daily by—		Dispatched by tube actually advanced over other means.	First-class mail received daily by—		Received by tube actually advanced in delivery.	First-class mail originating in district for delivery in same city.
	Dispatched.	Delivered.	Tube.	Other means.		Tube.	Other means.		
Pieces.	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*
106,988	65,310	92,055	88,783	108,257	[a] 24,726	218,981	52,867	32,164	61,898
24,896	18,447	15,709	65,651	30,017	16,716	61,241	13,716	7,168	61,898
			[b] 19,248	2,743	1,434	13,130	6,003	3,207	11,049
131,884	83,757	107,764	173,682	141,017	42,874	293,352	72,586	42,539	134,845
95,499	48,127	79,212	41,993	10,973	5,734	52,521	24,014	12,847	31,639
496,907	238,598	327,357	215,675	314,068	48,610	345,773	264,796	55,386	225,059

PHILADELPHIA, PA.

Pieces.	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*
351,120	351,202	278,253	457,734	495,847	32,737	447,219	396,668	55,902	239,141
.....	.....	.....	37,400	96,460	.....	24,650	80,570	.....	52,100
.....	.....	.....	.....	36,450	.....	.....	19,500	.....	.....
54,986	11,769	34,687	.....	40,666	.....	.....	53,472	.....	22,880
39,596	11,299	29,631	29,092	4,480	29,092	31,619	7,977	6,604	20,534
30,090	10,759	10,519	23,490	1,600	9,396	23,270	3,967	9,308	10,260
44,499	17,390	22,326	41,912	3,533	38,562	45,797	2,795	43,195	39,690
38,183	14,835	27,203	30,742	2,542	19,922	33,975	2,800	12,272	11,383
41,265	6,693	5,067	.....	16,963	.....	.....	40,690	.....	2,027
.....	.....	.....	99,750	6,250	.....	1,475	.....	.....	42,400
599,739	423,947	407,686	720,120	704,791	129,709	608,005	608,439	127,281	440,415
960,819	523,794	527,226	720,120	993,433	129,709	608,005	955,300	127,281	443,207

CHICAGO, ILL.

Pieces.	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*
.....	450,168	(a)	1,187,572	392,209	413,501	135,000	57,363	.....	258,576
633,750	204,580	511,458	574,350	2,150	28,166	388,066	393,800	5,148	.....
298,620	55,961	50,670	424,400	329,042	53,328	616,100	449,457	52,750	36,626
92,500	4,096	23,696	314,660	47,997	38,000	273,857	262,235	9,250	22,084
32,983	2,133	7,745	.....	3,057	.....	.....	33,642	.....	2,730
27,438	3,839	11,334	.....	4,022	.....	.....	25,620	.....	581
28,300	3,390	17,236	.....	3,200	.....	.....	28,000	.....	500
38,354	1,722	10,437	.....	1,240	.....	.....	37,314	.....	1,663
14,213	1,098	7,002	.....	5,201	.....	.....	14,796	.....	1,652
51,327	11,782	33,136	35,221	1,506	10,228	45,980	5,262	21,523	3,525
26,960	12,051	25,334	14,848	655	3,561	25,912	539	4,508	4,468
45,828	8,704	33,065	19,028	523	19,028	33,666	11,662	6,075	3,607
1,290,273	759,524	731,113	2,570,079	790,802	565,812	1,518,581	1,319,690	99,254	336,012
1,338,076	498,512	979,930	2,570,079	790,802	565,812	1,518,581	1,319,690	99,254	467,895

ST. LOUIS, MO.

Pieces.	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*	*Pieces.*
129,117	144,761	251,085	281,074	405,984	165,753	157,190	80,558	43,522	175,908
15,643	18,739	.....	157,003	135,854	250,261	12,737	237,524	126	8,256
27,730	.....	.....	23,759	.....	.....	27,724	6	1,880	5,397
172,490	163,500	251,085	461,836	541,838	416,014	197,651	318,088	45,528	189,561
474,583	163,500	251,085	461,836	541,838	416,014	197,651	318,088	45,528	189,561

[a] Figures are based on half-hourly wagon service (7 a. m. to 5 p. m.) formerly existing.
[b] Includes mails for general post-office arriving at Station L from the Long Island Railroad.

Approximate cost of installation of pneumatic-tube systems.

[Itemized estimate by committee showing cost of tube line per trench foot in the several cities having tube service.]

	Boston.		New York.	Brooklyn.	Philadelphia.	Chicago.	St. Louis.
	A.	B.	C.	D.	E.	F.	G.
Mileage used in estimates	6.89	6.89	19.3	1.35	6.02	7.41	2.09
Trench work per foot, including excavation, back filling, removal of dirt, rock allowance, repaving (using old material), laying pipes, leading joints, and material, inspection, bends, etc.	$2.04	$1.87	$4.41	$3.05	$1.06	$1.21	$1.21
Pipe (8-inch double line, including boxing, freight, and cartage)	2.87	2.87	2.86	2.86	2.68	2.88	3.00
Bends, specials, drips, manholes	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Total construction per trench foot	6.07	5.90	8.43	7.07	4.90	5.25	5.37
Asphalt paving (new)	8.07	7.13	10.33	9.46	5.90	6.25	6.20
Granite paving (new)	7.07	6.13	9.43	9.10	.....	6.00	.....
Brick paving (new)	8.07	7.13	.....	.....	.....	6.00	5.96
Patent block paving (new)	8.07	7.13	.....	.....	.....	.....	.....

A.—F. A. Snow, John Hancock Building, Boston, Mass.
B.—Coleman Brothers, 15 Court square, Boston, Mass.
C.—Thos. Crimmins Contracting Company, 449 East Sixty-ninth street, New York, N. Y.
D.—A. T. Byrne, 350 Fulton street, Brooklyn, N. Y.
E.—W. S. P. Shields, Witherspoon Building, Philadelphia, Pa.
F.—James Lyman & Co., 1409 Ashland Block, Chicago, Ill.
G.—R. S. Colnon, 615 Merchant-Laclede Building, St. Louis, Mo.

Itemized estimate by committee, showing cost of entire system (tube line, terminal machines, and power plants) in the several cities having tube service.]

Items.	Boston.	New York and Brooklyn.	Philadelphia.	Chicago.	St. Louis.
Mileage used in estimates	6.89	20.65	6.02	7.41	2.09
Postal stations	8	21	7	7	3
Terminal machines	13	33	12	11	4
Power machines	9	26	17	7	2
Terminal machines, including installation, at $3,788	$49,244	$124,954	$45,456	$41,668	$15,052
Power machines, including installation, at $7,113	64,017	184,938	120,921	42,678	14,226
Total for machinery	113,261	309,892	166,377	84,346	29,278
Trench work complete, including laying pipe, leading joints, etc.	74,213	460,495	33,603	47,341	13,352
Paving, asphalt, new	72,758	205,450	31,786	39,125	9,159
Pipe (double line, including boring, freight, and cartage)	104,407	311,831	85,168	115,810	33,105
Bends, special drips, manholes, etc	42,199	126,476	36,771	45,385	12,801
Total for tube line complete	293,577	1,104,252	187,418	247,661	68,417
Engineering, specifications, supervision, carriers, and shop equipment (10 per cent)	40,683	142,413	35,379	32,987	9,769
Total cost	447,521	1,556,557	389,174	364,994	107,464
Cost per mile	64,952	75,378	64,647	49,257	51,418

Variety of machinery in use in the several cities having tube service.

	Boston.	New York.	Brooklyn.	Philadelphia.	Chicago.	St. Louis.
RECEIVERS.						
Open, circular table, single deck (Batcheller)	.....	.....	.....	3	.....	.....
Open, circular table, double deck (Batcheller)	.....	.....	.....	5	.....	.....
Closed single sluice gate (Batcheller)	1	6	.....	1	.....	.....
Closed single sluice gate (Stoddard)	.....	11	1	.....	3	.....
Closed single revolving valve (Pike)	7	.....	.....	.....	2	2
Closed double revolving valve (Pike)	5	.....	.....	.....	3	2
Closed double sluice gate (Batcheller)	.....	a 1	.....	.....	.....	.....
Closed double sluice gate (Stoddard)	.....	11	1	.....	6	.....
Closed tilting end (Batcheller)	a 1	.....	.....	3	.....	.....
Automatic combined receiver and dispatcher (Batcheller)	.....	3	.....	.....	.....	.....
Total (10 varieties)	13	31	2	12	14	4
TRANSMITTERS.						
Gravity (Batcheller)	.....	4	.....	12	.....	.....
Gravity (Stoddard)	3	.....	.....	.....	14	4
Gravity "goose neck"	2	20	2	.....	.....	.....
Gravity vertical (Blood)	.....	a 2	.....	.....	.....	.....
Cradle (Batcheller)	1	4	1	a 1	.....	.....
Rotary, 6-inch (Clay)	.....	.....	.....	2	.....	.....
Revolving valve	7	.....	.....	.....	.....	.....
Total (7 varieties)	13	28	3	14	14	4
POWER PLANTS.						
Compressors:						
Steam-driven—						
Rand Drill Co	3	4	2	.....	3	1
Ingersoll Co	.....	3	.....	.....	.....	.....
Ingersoll-Sargent Co	.....	1	.....	2	.....	.....
Laidlaw-Dunn-Gordon	.....	.....	1	.....	1	1
Electric—						
Belt driven, Rand Drill Co	5	.....	.....	.....	3	.....
Chain driven, Ingersoll-Sargent Co	.....	.....	.....	23	.....	.....
Direct connection, Laidlaw-Dunn-Gordon	.....	6	.....	.....	.....	.....
Total (7 varieties)	8	14	3	25	7	2
Blowers:						
Electric, belt driven, Connersville Co	2	5	.....	.....	2	.....
Electric, direct connected, Connersville Co	.....	5	.....	.....	.....	.....
Total (2 varieties)	2	10	.....	.....	2	.....
Motors:						
Direct current—						
50 horsepower, General Electric Co	7	7	.....	.....	.....	.....
65 horsepower, Fort Wayne Co	.....	8	.....	.....	.....	.....
90 horsepower, Fort Wayne Co	.....	2	.....	.....	3	.....
105 horsepower, Westinghouse Co	.....	.....	.....	.....	2	.....
Alternating current—						
12.74 horsepower, Westinghouse Co	.....	.....	.....	1	.....	.....
16.62 horsepower, Westinghouse Co	.....	.....	.....	1	.....	.....
21.6 horsepower, Westinghouse Co	.....	.....	.....	5	.....	.....
23.17 horsepower, Westinghouse Co	.....	.....	.....	2	.....	.....
30 horsepower, Westinghouse Co	.....	.....	.....	3	.....	.....
40 horsepower, Westinghouse Co	.....	.....	.....	3	.....	.....
50 horsepower, Westinghouse Co	.....	.....	.....	8	.....	.....
Total	7	17	.....	23	5	.....

a Out of use.

Approximate space used in post-offices and stations by pneumatic terminals and power plants, and rental value.

	Item.	Space.	Price per foot.	Total.
Boston, Mass.:		*Feet.*		
General post-office	Terminals	337	$2.00	$674.00
	Power	1,568	1.00	1,568.00
North Station	Terminals	132	1.14	150.48
South Station	Terminals	306	1.00	306.00
Back Bay Station	Terminals	481	1.04	500.24
Essex Station	Terminals	1,080	.55	594.00
	Power	1,260	.46	579.60
	Shop	372	.46	171.12
Station A	Terminals	677	.45	304.65
Roxbury Station	Terminals	650	.50	325.00
	Power	650	.30	195.00
Upham Corner Station	Terminals	900	.33	297.00
	Power	5,000	.10	500.00
Total				6,165.09
Brooklyn, N. Y.:				
General post-office	Terminals	208	2.00	416.00
	Power	971	.75	728.25
Station L	Terminals	137	1.47	201.39
Total				1,345.64
Chicago, Ill.:				
General post-office	Terminals	1,150	2.00	2,300.00
	Power	1,604	1.00	1,604.00
	Shops	650	.50	325.00
La Salle Station	Terminals	350	1.00	350.00
Kinzie Station	Terminals	160	1.00	160.00
Wells Street Terminal	Terminals	132	.50	66.00
Illinois Central Station	Terminals	331	1.00	331.00
Twenty-second Street Station	Terminals	177	.83	146.91
Armour Station	Terminals	210	.82	172.20
	Power	3,890	.13	505.70
Stock Yards Station	Terminals	122	.88	107.36
	Power	230	.25	57.50
Station U	Terminals	163	.59	96.17
Total				6,221.84
New York, N. Y.:				
General post-office	Terminals	1,800	3.00	5,400.00
	Power	2,820	1.00	2,820.00
Hudson Terminal Station	Terminals	330	2.11	696.30
Madison Square Station	Terminals	510	1.76	897.60
Times Square Station	Terminals	490	2.13	1,043.70
	Power	1,508	.50	754.00
Wall Street Station	Terminals	252	3.47	874.44
Station A	Terminals	336	1.25	420.00
D	Terminals	464	1.52	705.28
E	Terminals	350	1.22	427.00
F	Terminals	240	2.00	480.00
G	Terminals	480	1.98	950.40
H	Terminals	616	.92	566.72
	Power	2,972	.92	2,734.24
J	Terminals	384	1.00	384.00
	Power	566	.30	169.80
L	Terminals	360	1.43	514.80
	Power	1,065	.40	426.00
N	Terminals	420	1.94	814.80
O	Terminals	576	1.16	668.16
	Power	1,426	.50	713.00
P	Terminals	260	3.00	780.00
V	Terminals	216	2.08	449.28
W	Terminals	331	.77	254.87
	Power	960	.40	384.00
Total				24,328.39
Philadelphia, Pa.:				
General post-office	Terminals	668	2.00	1,336.00
	Power	3,944	1.00	3,944.00
Bourse Station	Terminals	67	.73	48.91
Reading Terminal Station	Terminals	210	.65	136.50
Broad Street Station	Terminals	288	1.44	414.72
Station J	Terminals	240	.56	134.40
	Power	889	.28	248.92
C	Terminals	183	.43	78.69
	Power	1,320	.22	290.40

e(s)·

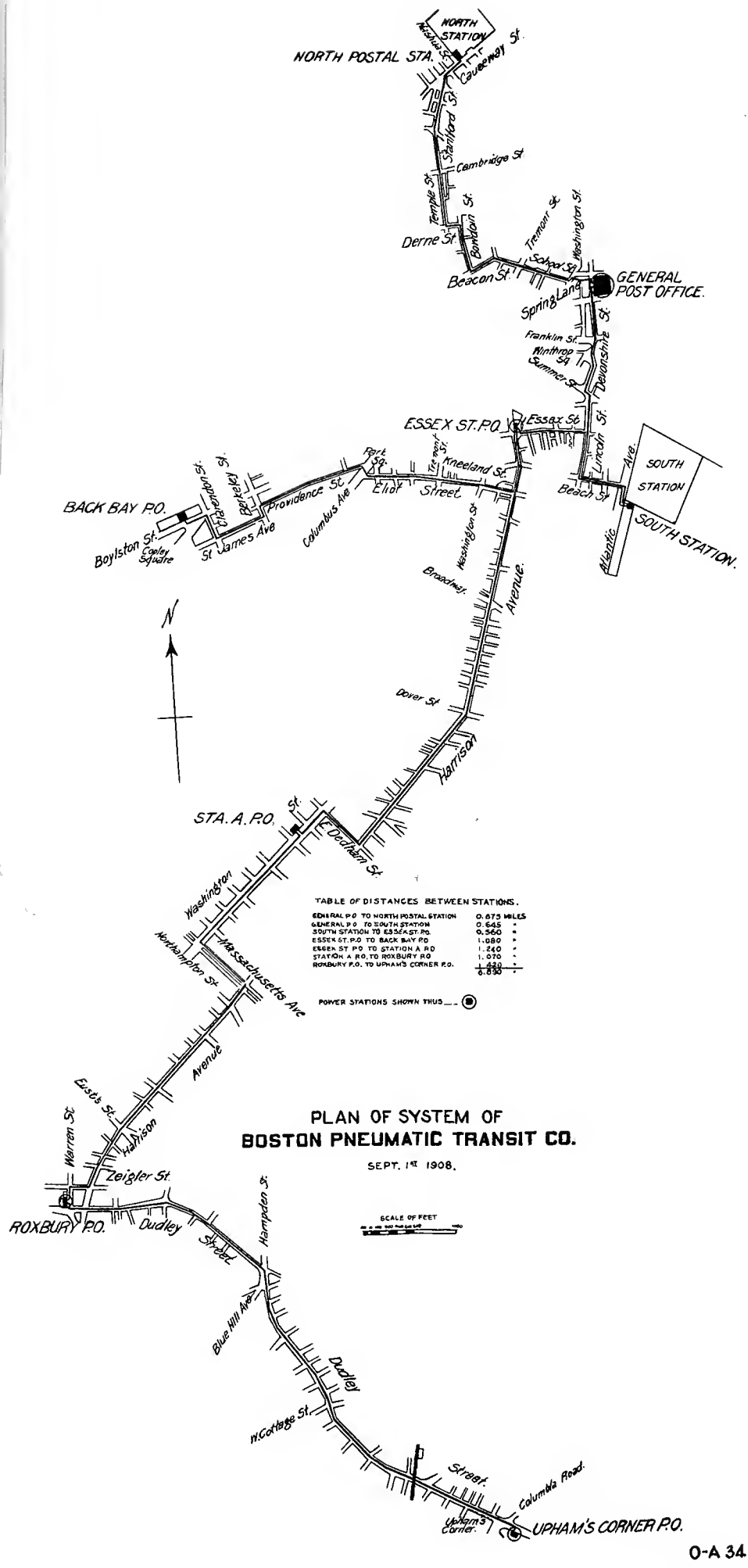


TABLE OF DISTANCES BETWEEN STATIONS.

GENERAL P.O. TO NORTH POSTAL STATION	0.675 MILES
GENERAL P.O. TO SOUTH STATION	0.645 "
SOUTH STATION TO ESSEX ST. P.O.	0.560 "
ESSEX ST. P.O. TO BACK BAY P.O.	1.080 "
ESSEX ST. P.O. TO STATION A P.O.	1.240 "
STATION A P.O. TO ROXBURY P.O.	1.070 "
ROXBURY P.O. TO UPHAM'S CORNER P.O.	1.420 "
	6.890 "

POWER STATIONS SHOWN THUS ___ ◉

PLAN OF SYSTEM OF BOSTON PNEUMATIC TRANSIT CO.

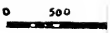
SEPT. 1ST 1908.

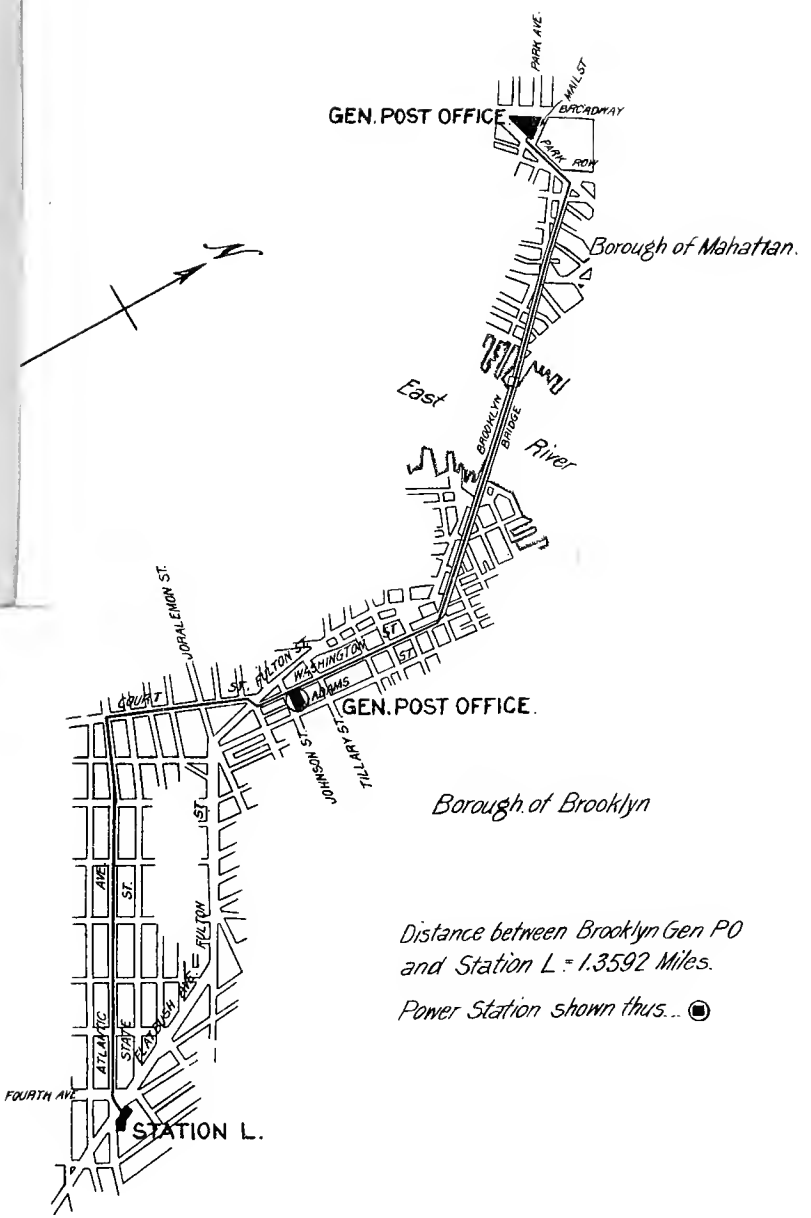
SCALE OF FEET

0-A 34

House Doc. No. 1220; 60th Cong., 2d Sess.

ANDREW H. GRAHAM CO. PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.


0
500



PLAN OF BROOKLYN SYSTEM.
NEW YORK PNEUMATIC SERVICE CO.
SEPT. 1ST, 1908.

SCALE OF FEET
0 500 1000 2000 3000 4000

O-A 30

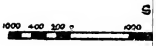
House Doc. No 1220, 60th Cong., 2d Sess.

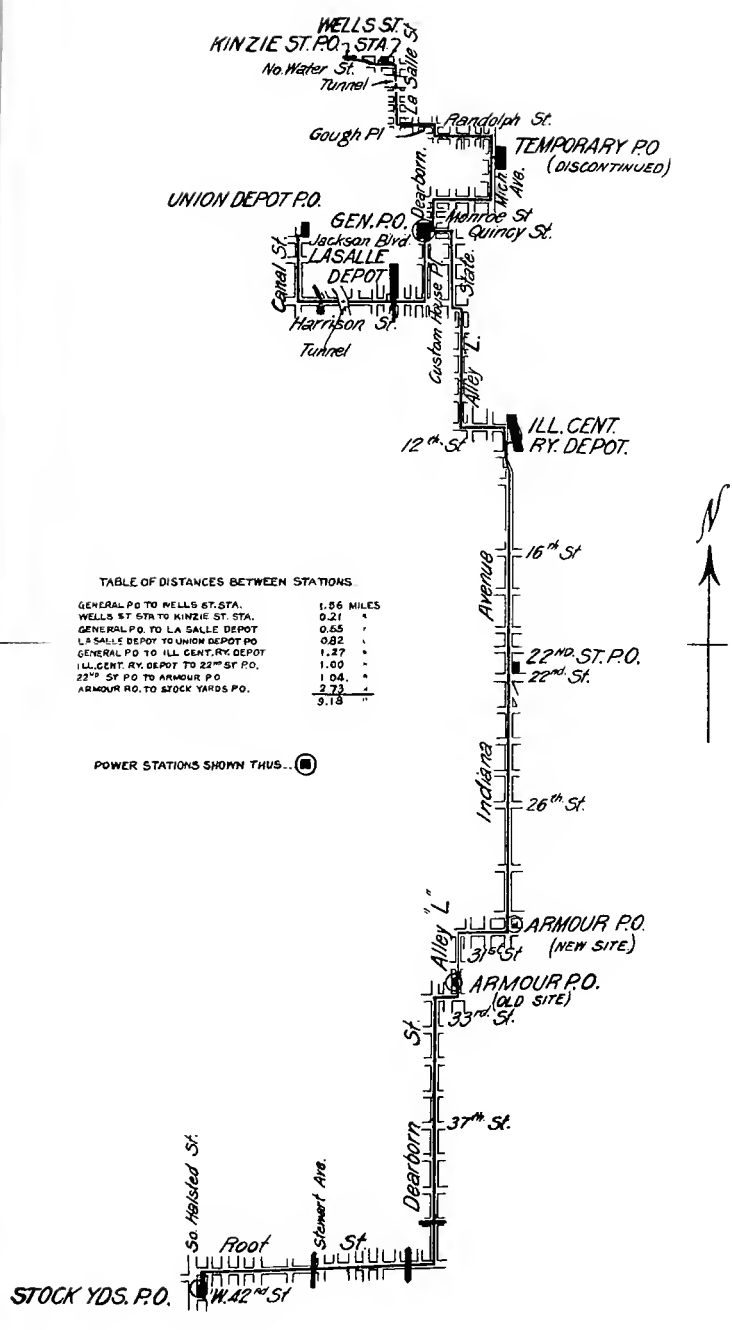
Page(s):

PLAN Of

CHICAGO POSTAL

SEP





PLAN OF SYSTEM OF
CHICAGO POSTAL PNEUMATIC TUBE CO.

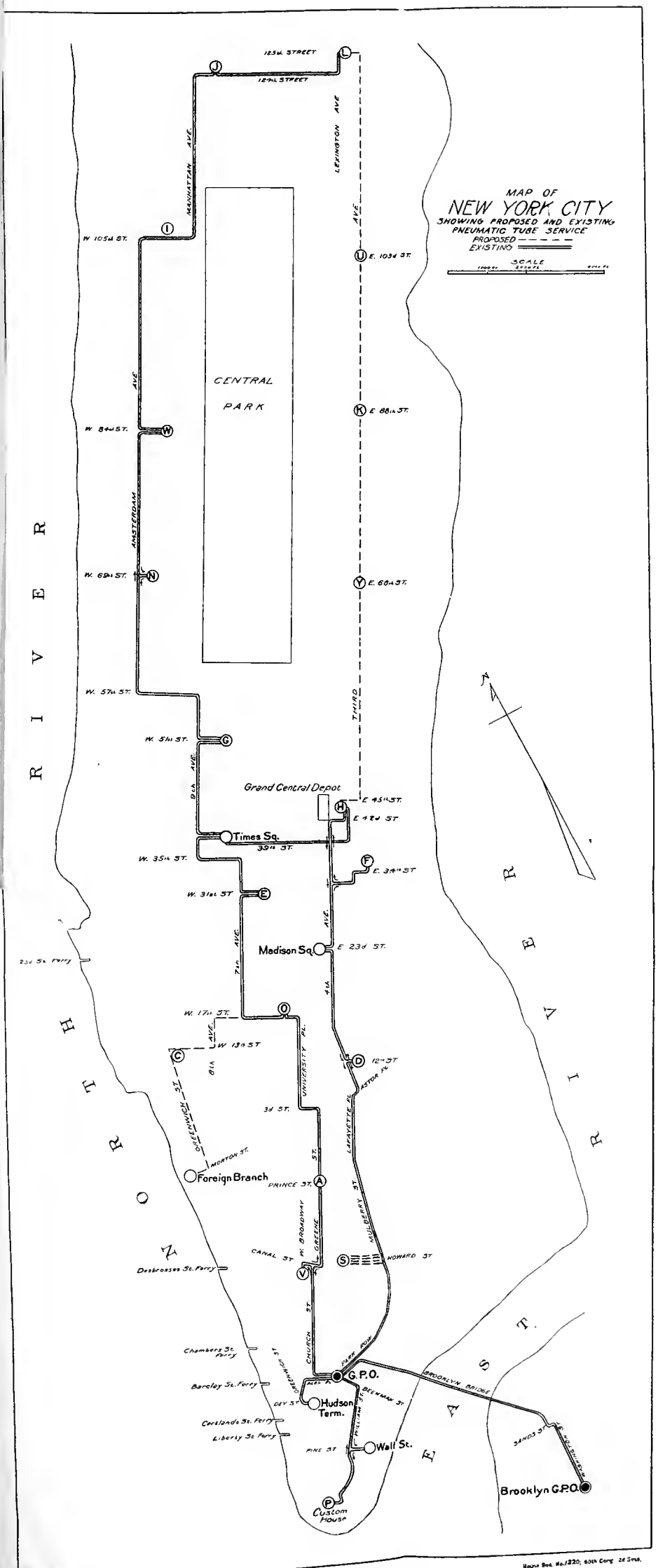
SEPT 1ST. 1908.

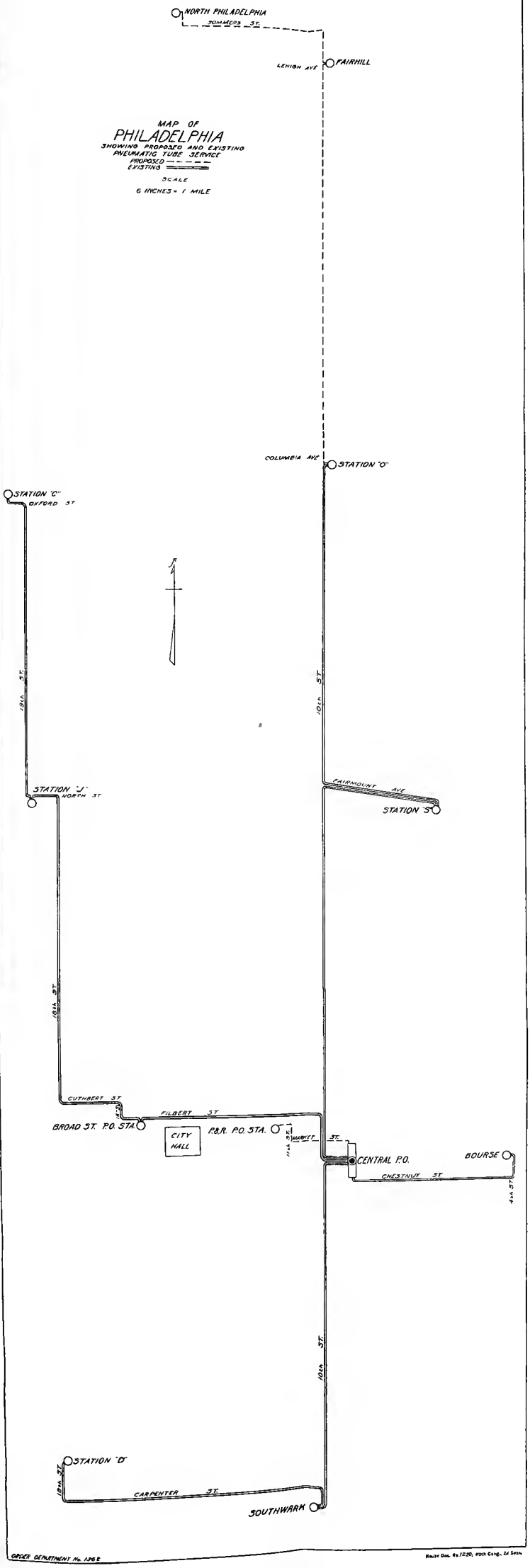
SCALE OF FEET

1000 500 0 1000 2000 3000 4000 5000 1 MILE

O-A 32

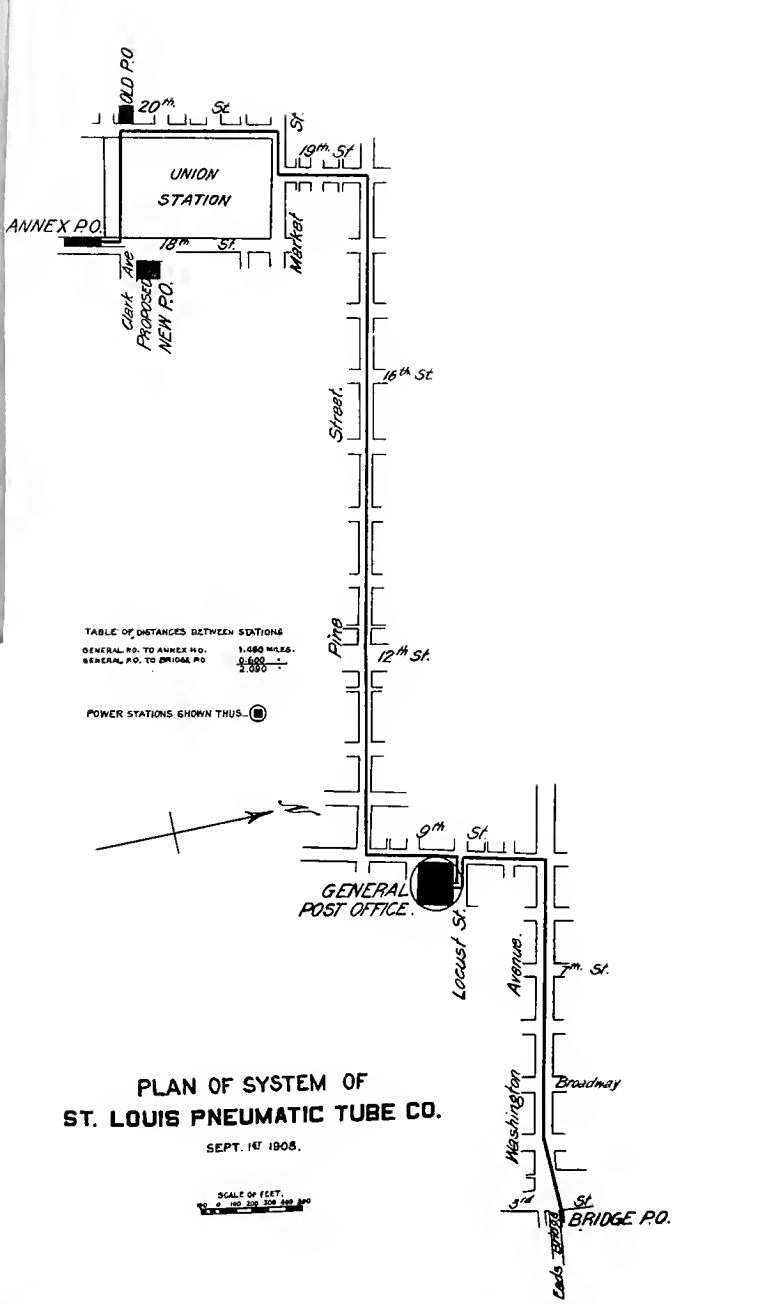
House Doc. No. 1220, 60th Cong. 2d Sess.


MAP OF
NEW YORK CITY
SHOWING PROPOSED AND EXISTING
PNEUMATIC TUBE SERVICE
PROPOSED
EXISTING
SCALE
CENTRAL
PARK
RIVER
HUDSON
EAST
RIVER
125th STREET
124th STREET
LEXINGTON AVE
MANHATTAN AVE
AMSTERDAM AVE
W. 105th ST.
E. 103d ST.
W. 84th ST.
E. 86th ST.
W. 68th ST.
E. 68th ST.
W. 57th ST.
THIRD AVE
W. 51st ST.
9th AVE
Grand Central Depot
E. 45th ST.
E. 42d ST.
Times Sq.
42d ST.
W. 35th ST.
E. 34th ST.
W. 31st ST.
8th AVE
7th AVE
Madison Sq.
E. 23d ST.
4th AVE
23d St. Ferry
W. 17th ST.
W. 13th ST.
6th AVE
GREENWICH ST.
UNIVERSITY PL.
ASTOR PL.
12th ST
3d ST.
LAFAYETTE PL.
MORTON ST.
Foreign Branch
PRINCE ST.
MULBERRY ST.
W. BROADWAY
GREENE ST.
CANAL ST.
HOWARD ST
Desbrosses St. Ferry
CHURCH ST.
Chambers St. Ferry
PARK ROW
G.P.O.
BROOKLYN BRIDGE
Barclay St. Ferry
DEY ST.
Hudson Term.
BEEKMAN ST.
Cortlandt St. Ferry
Liberty St. Ferry
WILLIAM ST.
FINE ST.
Wall St.
SANDS ST.
Brooklyn G.P.O.
Custom House
ORDER DEPT No 1861.
House Doc. No. 220, 60th Cong. 2d Sess.



OFFICE DEPARTMENT No. 1962

House Doc. No. 1220, 60th Cong., 2d Sess.


OLD P.O
20th St
UNION STATION
ANNEX P.O.
18th St
Clark Ave
PROPOSED NEW P.O.
19th St
Market
Street.
16th St
Pine
12th St
9th St
GENERAL POST OFFICE.
Locust St
Avenue.
7th St
Washington
Broadway
3rd St
BRIDGE P.O.
Eads Bridge
TABLE OF DISTANCES BETWEEN STATIONS
GENERAL P.O. TO ANNEX P.O. 1,480 MILES.
GENERAL P.O. TO BRIDGE P.O 0.600 + 2.080 +
POWER STATIONS SHOWN THUS-
PLAN OF SYSTEM OF
ST. LOUIS PNEUMATIC TUBE CO.
SEPT. 1ST 1908.
SCALE OF FEET.
0 100 200 300 400 600

0-A 33

Approximate space used in post-offices and stations, etc.—Continued.

Item.		Space.	Price per foot.	Total.
Philadelphia, Pa.—Continued.		*Feet.*		
Station S	Terminals	241	$0.67	$161.47
	Power	966	.34	328.44
O	Terminals	268	.56	150.08
	Power	1,047	.28	293.16
Southwark Station	Terminals	246	.45	110.70
	Power	1,013	.23	232.99
Station D	Terminals	154	.60	92.40
	Power	362	.20	72.40
Total				8,074.18
St. Louis, Mo.:				
General post-office	Terminals	377	2.00	754.00
	Power	900	1.00	900.00
	Shop	1,516	.50	758.00
Annex Station	Terminals	280	.61	170.80
Bridge Station	Terminals	154	1.46	224.84
Total				2,807.64

RECAPITULATION.

	Terminals.	Power.	Shop.	Total.
Boston, Mass	$3,151.37	$2,842.60	$171.12	$6,165.09
Brooklyn, N. Y	617.39	728.25		1,345.64
Chicago, Ill	3,729.64	2,167.20	325.00	6,221.84
New York, N. Y	16,327.35	8,001.04		24,328.39
Philadelphia, Pa	2,663.87	5,401.31		8,074.18
St. Louis, Mo	1,149.64	900.00	758.00	2,807.64
	27,639.26	20,040.40	1,254.12	50,196.90

POST-OFFICE DEPARTMENT,
SECOND ASSISTANT POSTMASTER-GENERAL,
DIVISION OF RAILWAY ADJUSTMENTS,
Washington, September 28, 1908.

HON. GEO. A. HIBBARD,
Mayor of the City of Boston, Mass.

SIR: The commission appointed by the Postmaster-General to investigate and report to him with reference to the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube mail service and operating the same, etc., appointed a subcommittee, consisting of Messrs. Stewart, Bradley, Masten, and Norris, to take up the investigation and details of the inquiry as provided by law. Accordingly we have the honor to submit the following:

The Postmaster-General has contracted with the Boston Pneumatic Transit Company, a corporation organized under the laws of the State of Massachusetts, for the installation of pneumatic tubes and necessary power plants and operating machinery, and the operation of pneumatic-tube mail service as contractor with the United States in the city of Boston for the period commencing November 1, 1906, and ending June 30, 1916. The contracting company has been requested to furnish you at once a map showing the lines contracted for, those in operation separate from those under consideration.

In the act of March 27, 1908, making appropriation for the service of the Post-Office Department for the fiscal year ending June 30, 1909, Congress provided as follows:

"And the Postmaster-General is hereby authorized and directed to investigate and report to Congress not later than January 1, 1909, the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube service, and thereafter operating the same in the cities where such service is now in operation, and also ascertain and report the approximate cost of purchase and likewise of installation and the cost of maintenance and operation."

One of the important questions for consideration of the commission, and ultimately the Postmaster-General and Congress, is the relations which exist between the United States and the municipality of Boston, and the attitude of the latter toward the former in the matter of the performance of mail service by pneumatic tubes through the streets and municipalities, in the event the United States should purchase the tubes now laid or install others for the direct performance of mail service thereby.

We therefore have the honor to request that we be furnished with a copy of existing laws and ordinances relative to the granting of franchises in Boston and such other matters of regulation as may exist relative to the installation and operation of such property in the streets. We also have to request to be informed as to your opinion regarding the application of the local ordinances respecting the franchises, etc., to the United States in the matter of the installation of pneumatic tubes and the operation of mail service through the same. In this connection we beg leave to submit for consideration our understanding with respect to the general rights of the United States in the conduct of the mail service. These general propositions may be stated as follows:

That the Constitution of the United States confers upon Congress the power "to establish post-offices and post-roads." (Constitution, art. 1, sec. 8.)

That this power granted to Congress carries with it all powers necessary to make it effective.

That all the streets of a city like Boston over which letter-carrier routes are established are post routes under the law.

That the conduct of the postal business by the Post-Office Department is a governmental function.

That any statute or ordinance which imposes any restriction on the free exercise of this function other than to make the agents of the Government subject to the local police regulations or the police power of the State, will have no effect as against the United States.

As our report to the Postmaster-General must be made at an early day, I have the honor to request as early a reply as practicable.

Very respectfully,

JOSEPH STEWART,
Chairman Subcommittee Pneumatic-Tube Commission.

CITY OF BOSTON, LAW DEPARTMENT,
73 Tremont Street, Boston, October 7, 1908.

JOSEPH STEWART, Esq.,
Chairman Subcommittee, Pneumatic-Tube Commission,
Division of Railway Adjustments, Post-Office Department,
Washington, D. C.

DEAR SIR: Your letter to Mayor Hibbard of September 28 has been forwarded to me for an answer.

In reply, I would state that under our law public ways in Massachusetts are the property of the Commonwealth and under its control. The statutes bearing upon the matter in question are sections 76, 77, and 78 of chapter 110 of the Revised Laws of Massachusetts. Said sections read as follows:

"SEC. 76. Gas-light companies, corporations organized for the purpose of transporting the United States mail, merchandise, and other articles by means of pneumatic pressure or power, corporations engaged in or organized for the purpose of manufacturing, buying, selling, distributing, or dealing in artificial cold and refrigerating and cooling materials, and corporations organized for any of the purposes mentioned in section nine may, with the consent in writing of the mayor and aldermen of a city, or the selectmen of a town, dig up and open the ground in any of the streets, lanes, and highways thereof, so far as is necessary to accomplish the objects of the corporation; but such consent shall not affect the right or remedy to recover damages for an injury caused to persons or property by the acts of such corporations. They shall put all such streets, lanes, and highways into as good repair as they were in when opened; and upon failure so to do within a reasonable time, shall be guilty of a nuisance.

"SEC. 77. If a person who is injured in his person or property by a defect in a highway which is caused by the operations of a company or corporation described in the preceding section in laying down or repairing its pipes or otherwise obstructing such way recovers damages therefor of the city or town

wherein such injury is received, such city or town shall, if such company or corporation is liable for said damages and has reasonable notice to appear and defend the original action, be entitled to recover of such company or corporation the damages so recovered from it with the taxable costs of both parties in such action.

"SEC. 78. The mayor and aldermen of a city or the selectmen of a town in which pipes or conductors of such company or corporation are sunk may regulate, restrict, and control all acts and doings of such company or corporation which may in any manner affect the health, safety, convenience, or property of the inhabitants of such city or town."

Under section 76 the Boston Pneumatic Transit Company may, with the consent of the mayor and aldermen, dig up and open the streets of the city.

The ordinances of the city provide what shall be done by such corporation after the consent of the mayor and aldermen is given. The provisions at present governing the issuing of such a permit are contained in sections 9 and 11 of the ordinances concerning the street department, a copy of which I inclose with the sections marked. You will notice under section 9 that it is provided that the terms of it shall be those stated in chapter 3, section 21, of the Revised Ordinances of 1898. Said section reads as follows:

"SEC. 21. Every officer in charge of a department issuing a license or permit shall insert therein a condition that the person accepting the same shall conform to the statutes and ordinances and the specifications in the license or permit; that the license or permit may be revoked at any time by the authority issuing it; that the violation of any of its specifications shall work an immediate revocation of the license or permit, and that such person shall indemnify and save harmless the city from any damage it may sustain, or be required to pay, by reason of the doing of the work licensed or permitted, or by reason of any act or neglect of himself or of any of his employees relating to such work, or by reason of any violation of any specifications; provided that nothing herein contained shall be construed to prevent the insertion of any other specifications deemed advisable by the authority issuing such license or permit."

I agree with you as to the abstract principles of law which govern this matter—that is, that the streets of a city like Boston over which letter-carrier routes are established are post routes under the law, and that the conduct of the postal business by the Post-Office Department is a governmental function.

These general principles have never heretofore been regarded as allowing a corporation licensed by the United States to dig up the streets of a city and destroy their use by the traveling public without the consent of the local authorities, or because a railroad had a contract to carry the mails, to give it a license to run through the streets of a city and injure the property of the citizens without compensation.

The conditions attached by the statute and by the ordinances passed under it to these permits seem to me reasonable ones and I have no doubt will be sustained by the courts.

Yours, truly,

THOMAS M. BABSON,
Corporation Counsel.

[Document 83. 1908.]

[SEAL.]

ORDINANCES OF 1908.

CHAPTER 3.—*Concerning consolidation of certain departments with the street department.*

[In the Year One Thousand Nine Hundred and Eight.]

An ordinance repealing chapters one, two, and three of the ordinances of 1906, and chapter twenty-two of the revised ordinances of 1898, and consolidating the lamp department and the departments created by said chapter one of the ordinances of 1906.

Be it ordained by the city council of Boston, as follows:

SECTION 1. The street department shall be under the charge of the superintendent of streets, who shall construct all streets and sewers; shall have discretionary power as to the grades, materials, and other particulars of construction of streets, sidewalks, and sewers; shall have charge of and keep clean and in good condition and repair the streets, the pumping station, and reservoirs of the improved sewerage system of sewers under the control of the city and the

catch-basins in the streets connected with the sewers; shall keep the streets properly watered; shall remove from yards and areas, when so placed as to be easily removed, all ashes accumulated from the burning of materials for heating habitations, cooking, and other domestic purposes, all house dirt, house offal, and all noxious and refuse substances; shall, on the 15th day of each month, send to the city auditor detailed bills of all materials, tools, and machinery furnished by either of the divisions of said department to any other such division, or for any special work.

SEC. 2. Said superintendent shall have the care and management of the ferries owned by the city; shall purchase or build all boats and make the necessary repairs and alterations on the slips, drops, buildings, and boats used for ferry purposes; and shall cause all moneys received by him or his subordinates from tolls and other sources to be paid to the city collector on the day following the day of the receipt thereof, but may retain in the possession of the clerk to the deputy superintendent in charge of the ferry division a sum not exceeding one thousand dollars for making change and for other purposes.

SEC. 3. Said superintendent shall have charge of all lamps established by the board of aldermen and maintained at the expense of the city, of all lamps set up in parks, parkways, or public grounds, and of all lamp posts, posts, or fixtures connected with such lamps, and shall set up and affix lamps in the streets; shall have the care and custody of all city property hitherto in the possession of the lamp department, or that shall hereafter be acquired for the purpose of street lighting, and shall maintain and keep the same in good repair; shall see that the streets are lighted by such methods of lighting as the board of aldermen may from time to time order, and that the lamps in the streets are lighted and extinguished at such times as are ordered by the board of aldermen.

SEC. 4. Said superintendent shall have the care and management of all bridges which are used as highways, and are in whole or in part under the charge of the city, and of so much of Harvard Bridge and Prison Point Bridge as are under the charge and control of the board of aldermen or of the city; shall be the commissioner to act with another commissioner for the city of Cambridge, and as such commissioner shall have and exercise all the powers in relation to West Boston Bridge and Craigie Bridge conferred by chapter three hundred and two of the acts of the year 1870; shall, when he exposes any portion of the structure on which the strength of a bridge depends, notify the city engineer and afford him an opportunity to inspect the same; shall make all repairs affecting the strength of any bridge under the supervision of the city engineer; shall keep the rails and planks in good order, and all dirt, snow, and ice removed from the sidewalks; shall keep all said bridges, or those parts thereof under his care, and the abutments, guards, draws, and wharves thereof clean and in good condition and repair; shall appoint draw tenders for the draws in bridges of which he has the care, and see that they properly perform their duties, and may remove them for such cause as he shall deem sufficient, and shall assign in his order of removal. Each draw tender so appointed shall take charge by night and by day of the draw of which he is draw tender; shall require from the person in charge of a vessel applying to pass through the draw a true statement of the name, extreme width, and draught of the vessel; shall determine the order in which vessels may pass through the draw, and may direct the placing of warping lines, anchors, and cables, and the use of any warping apparatus provided by the city; shall cause the draw to be opened for the passage of vessels when moving with the tide, and, in his discretion, when moving against the tide, if the wind is favorable or if the vessel is in tow; but he shall not allow any vessel to pass through the draws of bridges except such vessels as shall be ready to go through at the following times: 9.30 a. m., 11 a. m., 1.30 p. m., 3 p. m., 8.30 p. m., 11.30 p. m., and from 11.30 p. m. to 6 a. m.; shall cause the draw to be closed with all possible expedition after a vessel has passed through, not permitting more than one vessel to pass through at one opening of the draw, except that, when the draw is open and the bridge is free from persons desiring to cross, he may, in his discretion, permit other vessels to pass through before causing the draw to be closed; he shall perform such additional duties as said superintendent may require.

SEC. 5. Said superintendent shall place and maintain in one or more suitable conspicuous places, to be selected by him, on each street of the city, the name of the street and of the ward in which the street is situated, as shown by the records; shall require the number of each building on a street which he shall designate as the street number therefor to be affixed to or inscribed on the building by

the owner, and may determine the form, size, and material of any such number, and the place and mode of affixing or inscribing it.

SEC. 6. Said superintendent shall keep a book in which he shall record the date of every order for constructing a sewer, the name of the contractor or builder constructing it, the date of commencing and the date of completing the work, and the cost of the sewer; also a book in which he shall certify the names of the owners of estates assessed for the construction of the sewer, the number of feet of land of each estate bordering on the street or strip of land in which the sewer was laid, the amount of each assessment, the date of completion of the sewer, and the dates when the notices of assessments were given. He shall make and deliver to the city collector all bills for assessments as they become due.

SEC. 7. Said superintendent shall keep a plan for every existing and every new sewer, showing its depth, breadth, mode of construction, and general direction, and shall, from time to time, ascertain and insert on said plans all entries made into the sewers.

SEC. 8. Said superintendent shall, when about to build a new sewer or repair an old sewer, notify all abutters on that part of the line of said sewer when he proposes to do work, and afford them facilities for entering the sewer; and shall, when about to construct a new street, at least four weeks before beginning work, and when about to make a new surface of any street, at least two weeks before beginning work, notify the water commissioner and all persons authorized to place any structure in such street, and require and see that said department or persons having any work to be done in the streets so designated shall do all such work before the surface of such street is again prepared for and opened to public travel; and after the completion of the work then done on such street, shall not, for the space of one year thereafter, permit any department or person to disturb the surface of such street or way within the area of such previous disturbance, except in case of obvious necessity, a record of which shall be made in a book to be kept for that purpose.

SEC. 9. Said superintendent may issue permits to persons having authority in the premises to open, occupy, obstruct, and use portions of the streets, and should the portion of the street which has been so opened or used require repaving or resurfacing within a period of twelve months from the time it has been so used, the superintendent of streets shall notify the person applying for the permit under authority of which the portion was so used to make such repairs as in the opinion of said superintendent are necessary, and in case of the failure of the said person to make such repairs within one week from the date of the said notification then the superintendent of streets shall have the right to make such necessary repairs, and the expense of the same shall be paid by such person; all amounts received by the city collector for work done or materials furnished under notification of the superintendent of streets, as above authorized, shall be placed to the credit and used as a part of the appropriation for the street department. Every permit issued as aforesaid shall specify the time, place, size, and use of such opening, occupation, or obstruction, and the time within which the street must be put in good condition, and shall be on a condition the terms of which shall be those stated in chapter three, section twenty-one, of the Revised Ordinances of 1898, and in addition, that the person applying for the permit shall place and maintain from the beginning of twilight, through the whole of every night, over or near the place so occupied, opened, obstructed, or used, and over or near any dirt, gravel, or other material placed in or near such place, a light or lights sufficient to protect travelers from injury; shall place and maintain a safe and convenient way for the use of foot travelers and for vehicles around or over such place; shall protect such trees as shall be designated by the superintendent of public grounds in such manner as he shall specify; shall provide suitable sanitary accommodations for his employees; shall, if he does not, within the time prescribed by said superintendent, put the street into good condition satisfactory to said superintendent, pay whatever sum the said superintendent shall expend for putting it into such condition; and shall deliver up the permit to an officer of the police force of said city on or before the expiration of the time fixed in the permit for completing the work, such permit to be returned by said officer to the street department; said superintendent may, in addition to said specifications, specify in the permit, or after the issuing thereof, in writing, the kind of rail or fence to enclose the place, and the kind of way over or around such place, and the manner of constructing the same.

SEC. 10. Said superintendent may issue such a permit to any person who presents a permit from the water department to repair or lay water pipes.

SEC. 11. Said superintendent may issue such a permit to competent mechanics for the purpose of entering particular drains into public drains and sewers, on a condition the terms of which shall be those hereinbefore stated in section nine of this chapter, and, in addition, that the person applying for the permit shall make connection of the said drain with the said sewer only in the manner shown on the back of said permit, and only in the presence of an inspector of the sewer division; shall have on the ground, when the inspector arrives to see the connection made, any slant, bend, or curve to be used in making the connection; shall not cover up any work until inspected by one of said inspectors; shall not lay the drain in the same trench with a water pipe; shall not connect any exhaust from a steam engine, any blow-off from a steam boiler, or any other pipe for delivering steam or hot water, with the drain or sewer; shall, when he receives any pipe from the street department in exchange for another, return such other to the yard of the street department within twenty-four hours after receiving such exchange. Said superintendent shall in each drain permit specify the size, material, and mode of construction of the particular drain, and the direction and grade for laying it, but before issuing the permit for entering a drain into a particular public sewer, from land upon which a sewer assessment has not been paid, he shall be paid for the city an assessment of two cents per square foot for all land in the estate from which the entry is made within one hundred feet of the street or strip of land in which the sewer or particular drain is laid.

SEC. 12. Said superintendent may issue such a permit to a responsible person for the purpose of raising and lowering goods and merchandise into and from buildings, on a condition the terms of which shall be those stated in chapter three, section twenty-one, of the Revised Ordinances of 1898, and in addition that the person applying for the permit shall maintain, during the whole time the work is in progress good and sufficient barriers across the sidewalk, from the wall of the building to or from which the goods or merchandise are so raised, out to the curbstone or edge of the sidewalk, on each side of said goods or merchandise, sufficient to protect travelers from injury or danger; and that he will not encumber the sidewalk for more than fifteen minutes at a time for such work.

SEC. 13. Said superintendent shall issue such a permit to any person authorized by the board of aldermen to place a coal hole, vault, or coal slide under a street, or a cover thereto, on a condition the terms of which shall be those hereinbefore stated in section nine of this chapter, and in addition that the person applying for the permit shall make the underground structure, if a coal slide, with the sides at least eight inches thick, of good hard brick laid in cement; if other than a coal slide, with the outer wall next to the roadway at least two and one-half feet thick, of heavy granite blocks, laid in cement, the side walls at least one foot thick, of good hard brick, or of granite blocks, laid in cement; the top of iron, or iron and glass, or of rough-surfaced iron, or, at least six inches thick, either of good hard brick laid in the form of an arch turned in a good and sufficient manner, or of rough-hammered granite, or blue stone, or North River flagstone; shall make the opening of a coal hole or coal slide circular, and not more than eighteen inches in diameter, and furnish a cover therefor of iron, made with a rough upper surface, and with three or more iron rods or legs at least two feet in length, fitting closely to the side of the opening, and projecting downwards from the under side of the cover, and so constructed that, while the cover can be lifted perpendicularly, it cannot be tipped or easily removed from the opening.

SEC. 14. Said superintendent shall, when authorized thereto by the board of aldermen, issue such a permit to a building mover actually engaged in the business, for the purpose of moving a building through the streets, on a condition the terms of which shall be those stated in section nine of this chapter; provided, that an application for such permit, describing the locations from and to which, and the route over which, the building is to be moved, the length, width, and height of the building, and the principal material of its exterior and roof, and accompanied by the written consent of the building commissioner to the placing of the building on the lot proposed, shall be first made to said superintendent, who shall make an examination of the premises, and report thereon to the board of aldermen for its action. Whenever it appears that the moving of a building will encumber the tracks of any railroad corporation, a public hearing shall be given by the board of aldermen upon the subject before such permit is authorized.

SEC. 15. Said superintendent shall, when authorized thereto by an order of the board of aldermen, issue such a permit to a responsible person, for the purposes of laying, maintaining, and using wires, railway tracks, or rails in the streets, or wires, pipes, or conduits under the surface thereof, on a condition the terms of which shall be those stated in section nine of this chapter, and in addition that the person applying for the permit shall, whenever requested so to do by the mayor, furnish in his conduits for wires accommodations free of charge for all wires belonging to, or to be used by, the city; shall remove the conduits and wires whenever directed, and not until directed, so to do by the city council; and shall not disturb or interfere with any wires, pipes, or sewers lawfully laid in such street or connected therewith.

SEC. 16. Said superintendent shall, when authorized thereto by an order of the board of aldermen, issue such a permit to a responsible person for the purpose of placing and maintaining in the streets poles for the support of wires, on a condition the terms of which shall be those hereinbefore stated in section nine of this chapter, and in addition that the person applying for the permit shall keep said poles well painted and in good condition, to the satisfaction of the superintendent of streets; shall place the wires on said poles not less than twenty-five feet from the ground; shall keep the name of the person owning the pole distinctly painted on the cross bars used and occupied by him on the pole, and also on the pole at a point not less than six feet nor more than eight feet from the ground; shall allow the departments of the city the exclusive use of the upper cross bar and top of each pole, free of all charge, for the purpose of placing wires thereon; shall not suffer or permit any other person to place or keep wires on said poles, or upon the fixtures thereto affixed, without permission being first obtained in writing from the board of aldermen; shall not remove any pole erected under this order until, and shall remove any pole when, directed by the board of aldermen so to do; and that on the violation of any term of these conditions the said superintendent shall remove the poles at the expense of the person owning them.

SEC. 17. Said superintendent, before he delivers any such permit to any person for the applicant therefor, shall have received from such person a certificate that a copy of the permit, entered in a book kept for the purpose, is a correct copy of the permit he receives, and the applicant, unless an employee of the city applying for a permit for public work, shall have given a bond, in the case of permits under sections nine, eleven, twelve, and thirteen of this chapter, of one thousand dollars; under section fourteen of this chapter, of three thousand dollars; and under sections fifteen and sixteen of this chapter, of twenty thousand dollars; each bond, with one or more sureties satisfactory to said superintendent, conditioned to the faithful observance of the conditions and specifications of each and every permit thereafter issued on his application by the superintendent of streets; and said superintendent of streets may at any time require a new bond, which shall be considered a strengthening bond, unless the sureties on the former bond or bonds are expressly released from their liability by vote of the city council. No bond shall be required of any person to open a public street for the purpose of planting a tree therein if said person has been duly authorized by the proper municipal authorities to plant trees in said highways.

SEC. 18. Said superintendent shall not issue any such permit to a person who has within twelve months previous to his application violated or failed to observe the conditions or specifications of any such permit; but the issuing of such permits, and the opening, occupation, obstruction, and the use of portions of streets, and the making and maintaining of coal holes, vaults, and other permanent excavations under the surface of streets, and their covers, shall be subject to any permission, control, regulation, restriction, or revocation which the board of aldermen may make.

SEC. 19. Every owner of an estate hereafter maintaining any cellar, vault, coal hole, or other excavation under the part of the street adjacent to, or which is a part of, his estate shall do so only on condition that such maintenance shall be considered as an agreement on his part to hold the city harmless from any claims for damage to himself or the occupants of said estate resulting from gas, sewage, or water leaking into such excavation or upon such estate; and every such owner and every person maintaining a post, pole, or other structure in a street, or a wire, pipe, conduit, or other structure under a street shall do so only on the condition that such maintenance shall be considered as an agreement on his part with the city to keep the same and the covers thereof in good repair and condition at all times during his ownership, and to

indemnify and save harmless the city against any and all damages, costs, expenses, or compensation which it may sustain or be required to pay, by reason of such excavation or structure being under or in the street or being out of repair during his ownership, or by reason of any cover of the same being out of repair or unfastened during his ownership.

SEC. 20. Said superintendent shall require every person who maintains an entrance on a level with, or below, or a flight of steps descending immediately from, or near, the line of the street, and which is not otherwise safely or securely guarded to the satisfaction of said superintendent, to inclose such entrance or steps with a permanent iron railing on each side, at least three feet high from the top of the sidewalk or pavement, and to provide the same with a gate opening inwardly, or two iron chains across the entrance way, one near the top and the other half way from the ground to the top of the railing, and to keep said gates or chains closed during the night, unless the entrance or steps are sufficiently lighted to prevent accident.

SEC. 21. Said superintendent shall keep a record of the notices of defects in streets sent to him, with the name of the person giving the notice, and the time when given, and he shall without delay cause the locality of the alleged defect to be examined, and, if the defect is of such a character as to endanger the safety of public travel, shall do whatever may be necessary to protect the public from injury by the defect, and cause it to be immediately repaired; and every person in the employ of the city shall send to said superintendent notice of every such defect which may come to his notice.

SEC. 22. Said superintendent shall in his annual report include a statement of the repairs and expenditures on each street and on each bridge under his charge; of the number of times each draw of a bridge has been opened for the passage of vessels; of the number of vessels laden with cargo that have passed through each draw; of the condition of each ferry boat, slip, dock, tank, and building used for ferry purposes, and of the repairs and expenditures on each; and of the number of persons and teams of different classes that have passed over each ferry during the year.

SEC. 23. Chapters one, two, and three of the Ordinances of 1906 and chapter twenty-two of the Revised Ordinances of 1898 are hereby repealed.

IN COMMON COUNCIL, *March 19, 1908.*

Passed. Sent up for concurrence.

LEO F. MCCULLOUGH, *President.*

IN BOARD OF ALDERMEN, *March 23, 1908.*

Concurred.

LOUIS M. CLARK, *Chairman.*

Approved April 6, 1908.

G. A. HIBBARD, *Mayor.*

A true copy.
Attest:

JOHN T. PRIEST, *City Clerk.*

POST-OFFICE DEPARTMENT,
SECOND ASSISTANT POSTMASTER-GENERAL,
Washington, September 22, 1908.

HON. GEORGE B. MCCLELLAN,
Mayor of the City of New York, N. Y.

SIR: The commission appointed by the Postmaster-General to investigate and report to him with reference to the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube mail service and operating the same, etc., appointed a subcommittee, consisting of Messrs. Stewart, Bradley, Masten, and Norris, to take up the investigation and details of the inquiry as provided by law. Accordingly, we have the honor to submit the following:

The Postmaster-General has contracted with the New York Pneumatic Service Company, a corporation organized under the laws of the State of New York, for the installation of pneumatic tubes and necessary power plants and operating machinery and the operation of pneumatic-tube mail service as contractor with the United States in the cities of New York and Brooklyn, for a period of ten years, commencing November 1, 1906, and ending June 30, 1916. The

accompanying maps show the lines contracted for, those in operation separate from those under construction.

In the act of March 27, 1908, making appropriations for the service of the Post-Office Department for the fiscal year ending June 30, 1909, Congress provided as follows:

"And the Postmaster-General is hereby authorized and directed to investigate and report to Congress not later than January 1, 1909, the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube service, and thereafter operating the same in the cities where such service is now in operation, and also ascertain and report the approximate cost of purchase and likewise of installation and the cost of maintenance and operation."

One of the important questions for consideration of the commission, and ultimately the Postmaster-General and Congress, is the relations which would exist between the United States and the municipalities of New York and Brooklyn and the attitude of the latter toward the former in the matter of the performance of mail service by pneumatic tubes through the streets of said municipalities, in the event the United States should purchase the tubes now laid or install others for the direct performance of mail service thereby.

By an appointment with the assistant city counsellor, Mr. W. P. Burr, the subcommittee met him at his office and discussed this question, and it was agreed that the inquiry should be submitted to you formally. We therefore have to request that we be furnished with a copy of existing laws and ordinances relative to the granting of franchises in the cities named, and such other matters of regulation as may exist relative to the installation and operation of such property in the streets. We also have to request to be informed as to your opinion regarding the application of the local ordinances respecting the franchises, etc., to the United States in the matter of the installation of pneumatic tubes and the operation of mail service through the same. In this connection we beg leave to submit for consideration our understanding with respect to the general rights of the United States in the conduct of the mail service. These general propositions may be stated as follows:

That the Constitution of the United States confers upon Congress the power "to establish post-offices and post-roads." (Constitution, art. 1, sec. 8.)

That this power granted to Congress carries with it all powers necessary to make it effective.

That all the streets of a city like New York over which letter-carrier routes are established are post routes under the law.

That the conduct of the postal business by the Post-Office Department is a governmental function.

Any statute or ordinance which imposes any restriction on the free exercise of this function other than to make the agents of the Government subject to the local police regulations or the police power of the State, will have no effect as against the United States.

We have the honor to request as early a reply as practicable.

Very respectfully,

JOSEPH STEWART,
Chairman Subcommittee, Pneumatic Tube Commission.

CITY OF NEW YORK,
OFFICE OF THE MAYOR,
December 7, 1908.

HON. JOSEPH STEWART,
Chairman Subcommittee, Pneumatic Tube Commission,
Washington, D. C.

SIR: I received your communication of September 22, 1908, and referred the same to the corporation counsel for an opinion.

It appears, in this communication, that the Postmaster-General was authorized and directed to investigate and report to Congress not later than January 1, 1909, as to the feasibility of the United States Government purchasing, further installing, and operating a pneumatic-tube service in the cities where such service has been introduced. I am informed that the Postmaster-General, in pursuance of this instruction, selected a commission which in turn appointed a subcommittee, consisting of Messrs. Stewart, Bradley, Masten, and Norris, to take up the investigation and details of the question as directed by Congress.

Three questions are presented to me in your communication:

First. What is the attitude of the city of New York toward the United States Government in the matter of the operation of mail service by pneumatic tubes in the streets of the city, if the Government should purchase the tubes now laid or install others for mail service.

Second. I am requested to furnish a copy of existing laws and ordinances relative to the granting of franchises in New York City, and such other matters or regulations as may exist relative to the installation and operation of pneumatic tubes in the streets.

Third. I am requested to furnish your commission with my views on the application of local laws and ordinances to the United States Government in the matter of the installation of pneumatic tubes for the operation of mail service in the city.

Taking up the first question, I answer the same as follows:

The seventh and seventeenth subdivisions of the eighth section of article 1 of the Constitution of the United States provides:

"The Congress shall have power * * * (7) To establish post-offices and post-roads * * * (17) To make all laws which shall be necessary and proper for carrying into execution the foregoing powers; and all other powers vested by this constitution in the Government of the United States, or in any department or officer thereof."

I find that this subdivision of the section has been construed by Chief Justice Waite of the Supreme Court of the United States in Pensacola Telegraph Company *v.* The Western Union Telegraph Company (96 U. S., 1), where the learned Chief Justice said (p. 9):

"Post-offices and post-roads are established to facilitate the transmission of intelligence. Both commerce and the postal service are placed within the power of Congress, because, being national in their operation, they should be under the protecting care of the National Government.

"The powers thus granted are not confined to the instrumentalities of commerce or the postal service known or in use when the Constitution was adopted, but they keep pace with the progress of the country and adapt themselves to the new developments of time and circumstances. They extend from the horse with its rider to the stage coach, from the sailing vessel to the steam boat, from the coach and the steamboat to the railroad, and from the railroad to the telegraph, as these new agencies are successively brought into use to meet the demands of increasing population and wealth. They were intended for the government of the business to which they relate, at all times and under all circumstances. As they were intrusted to the general government for the good of the nation, it is not only the right, but the duty of Congress to see to it that intercourse among the States and the transmission of intelligence are not obstructed or necessarily encumbered by state legislation."

In Ex parte Jackson (96 U. S., 727), the Supreme Court, by Mr. Justice Field further said (p. 732):

"The power vested in Congress 'to establish post-offices and post-roads' has been practically construed, since the foundation of the Government, to authorize not merely the designation of the routes over which the mail shall be carried, and the offices where letters and other documents shall be received to be distributed or forwarded, but the carriage of the mail, and all measures necessary to secure its safe and speedy transit and the prompt delivery of its contents."

I further find that the streets of the city of New York have been established as post-roads of the United States Government (Western Union Telegraph Company *v.* City of New York, 38 Fed. Rep., 552).

In regard to the United States Government paying for the privilege of operating pneumatic tubes in the streets of the city, I find in M'Culloch *v.* State of Maryland (4 Wheat., 317), that Chief Justice Marshall, in a case where the question involved was whether the State of Maryland could tax the United States Bank located within its boundaries, said (p. 439):

"The court has bestowed on this subject its most deliberate consideration. The result is a conviction that the States have no power by taxation or otherwise, to retard, impede, burden, or in any manner control the operations of the constitutional laws enacted by Congress to carry into execution the powers vested in the general government. This is, we think, the unavoidable consequence of that supremacy which the Constitution has declared. We are unanimously of the opinion that the law passed by the Legislature of Maryland, imposing a tax on the Bank of the United States, is unconstitutional and void."

This view was reaffirmed in Telegraph Company *v.* Texas (105 U. S., 461), where the Supreme Court by Chief Justice Waite, at page 466, held that the

State of Texas could not charge a tax or toll for messages sent over the wires of this telegraph company by United States officials through the State of Texas. The court said:

"As to government messages it is a tax by the State on the means employed by the Government of the United States to execute its constitutional powers and, therefore, void. It was so decided in M'Culloch *v.* Maryland (4 Wheat. 316), and has never been doubted since."

It would therefore appear from these authorities that if Congress should authorize the Post-Office Department to maintain and operate pneumatic tubes in the city of New York, that no charge for the use of the highways could be exacted from the Government. This view, of course, is limited to the United States Government operating the pneumatic tubes in question, for if the same were owned and managed by a private corporation for its personal gain, a different rule appears to apply (Horn Silver Mining Co. *v.* State of New York, 145 U. S., 315; Western Union Telegraph Company *v.* Massachusetts, 125 U. S. 530).

There appears, however, a limitation upon the unqualified use of post-roads, namely the police power vested in the States and the municipalities therein.

In Patterson *v.* Kentucky (97 U. S., 501) Mr. Justice Harlan said (p. 504):

"By the settled doctrines of this court the police power extends at least to the protection of the lives, the health, and the property of the community against the injurious exercise by any citizen of his own rights. State legislation, strictly and legitimately for police purposes, does not, in the sense of the constitution, necessarily entrench upon any authority which has been confided, expressly or by implication, to the National Government."

In Western Union Telegraph Company *v.* Mayor of the City of New York (38 Fed. Rep., 552), Mr. Justice Wallace, in the well-known case where the state and local authorities forced the telegraph and telephone companies to take down overhead wires and install the same in conduits under the streets, said (p. 554):

"Nevertheless, persons and corporations enjoying grants and privileges from the United States exercising federal agencies and engaged in interstate commerce are not beyond the operation of the laws of the State in which they reside or carry on their business; and it is only when these laws incapacitate or unreasonably impede them in the exercise of their federal privileges or duties and transcend the power which each State possesses over its purely domestic affairs, whether of police or internal commerce, that they invade the national jurisdiction."

The same view was taken by Mr. Justice Simonton in City of Richmond *v.* Southern Bell Telephone Company (85 Fed. Rep., 19), where the learned justice said (p. 25):

"Streets and alleys in a city are public property placed under the supervision and control of the municipality, the representative of the sovereign power. They exercise this supervision and control for the benefit of the whole public, those living upon and those passing through such streets and alleys. And in the exercise of this supervision, which is the police power, they must see to it that the rights of the public and private persons are not infringed. * * * And as the municipality is the guardian of the public in this regard it can establish such lawful provisions as may regulate the use, always, however, avoiding such regulations as will make the use burdensome and intolerable, and so practically impossible."

I therefore answer your first question that (1) in my opinion Congress may authorize the use in the city of New York of the latest and most modern appliances for the mail service; (2) that if the United States Government deems it expedient to operate this new and modern invention, that the same may be mainained without charge; and (3) that this power vested in the United States Government is subject to such reasonable police regulations of the State and city in order that the public may be protected, but the United States Government not hindered or impeded in its work.

In reference to any private rights in the streets of the city I would refer your committee to the case of the Western Union Telegraph Company *v.* Pennsylvania Railroad (195 U. S., 540), where it was held that the right of way of the Pennsylvania Railroad Company was in its nature a private one, and the telegraph company, operating under the act of Congress of July, 1866, could not invade the same without due process of law.

In answer to your second request I send you herewith a memorandum of the different laws and regulations affecting the use of the streets.

In answer to your third question I inform you that I will cooperate in every way to secure state or municipal legislation if Congress should decide to authorize the Post-Office Department to operate and install a pneumatic-tube service in the city of New York.

I take this action as I consider it of the greatest importance that the citizens of this city should have the latest and most modern appliances to facilitate the transmission of the mail.

Respectfully, yours, GEORGE B. MCCLELLAN, *Mayor.*

MEMORANDUM AS TO PNEUMATIC TUBES IN THE CITY OF NEW YORK.

A brief history of the organization and operation of pneumatic-tube service in the greater city of New York is as follows:

TUBULAR DISPATCH COMPANY.

The Tubular Dispatch Company is a corporation organized and existing under the laws of the State of New York and particularly under the provisions of an act entitled "An act to provide for the transmission of letters, parcels, packages, mails, messages, merchandise, and property between the city of New York and the villages, towns, and cities in the vicinity thereof," passed May 9, 1874, being chapter 400 of the Laws of 1874, and under a further and supplemental act passed May, 1895, chapter 977 of the Laws of 1895.

The acts above referred to are as follows:

Chapter 400 of the Laws of 1874, section 1.

"L. W. Emerson (and others) and their assigns and such persons as they may associate with them are hereby authorized and empowered to lay down, construct, and maintain tubes of iron, wood, or other material, underground and beneath the bed of navigable waters in and between the city of New York and the villages, towns, and cities in the neighborhood thereof at such depth below the bed of such waters as not to interfere with the channels, anchorage, or navigation thereof, and for the purpose of such construction underground shall have the right to open any street or avenue in any incorporated town or city, by and with the consent of the corporate authorities of such town or city, excepting in the city of New York, where such consent shall be obtained from the commissioner of public works, and to convey letters, parcels, packages, mails, messages, merchandise, and property in and through said tubes for compensation by means of the pneumatic method of propulsion."

Supplemental act passed May, 1895, became a law June 7, 1895.

Chapter 977 of the Laws of 1895, section 1.

"In addition to the powers, rights, and privileges granted by chapter 400 of the Laws of 1874, entitled 'An act to provide for the transmission of letters, mails, messages, merchandise, and other properties between the city of New York and the villages, towns, and cities in the vicinity thereof,' a company incorporated under the provisions of said act, known as the Tubular Dispatch Company, shall have the right to use in addition to compressed air electricity or other mechanical method as a motive power."

In January, 1897, the Tubular Dispatch Company applied to General Collis, then commissioner of the department of public works, for permission to open streets for the purpose of laying down tubing for the transmission of letters, etc.

On February 9, 1897, the commissioner of public works issued a general permit to lay and maintain tubes from the general post-office to various substations throughout the city.

On June 14, 1897, a second permit was given to the company to install a circuit from the general post-office to the Produce Exchange Building in Beaver street.

On July 8, 1897, a general permit was given to install a circuit from the general post-office to Third avenue and Eighth street, to Twenty-third street and Madison avenue, to Third avenue and Twenty-eighth street, to Forty-fourth street and Lexington avenue.

On August 16, 1897, a further permit was issued to install a circuit from the general post-office to the Park Row approach of the New York and Brooklyn bridge.

On November 22, 1897, a permit was issued to install a circuit from the United States public stores to the custom-house at Wall and William streets.

These permits were all executed by the company, which agreed in its acceptance to abide by the terms and conditions therein imposed.

It is stated that the routes covered some 24 miles of streets, but that owing to the methods of construction necessary to be employed over 100 miles of tubing would have to be laid to complete the routes applied for.

It further appears that the company did not construct and lay tubing throughout all of the routes described in its application for the permits for the reason that the method of construction and operation was a very expensive one and the system at that time was very novel, and for the further reason that the company did not secure from the United States Government contracts covering its entire route. It did, however, secure from the Government contracts for pneumatic-tube propulsion system between the New York general post-office and the Brooklyn post-office and between the general post-office in New York and the substation at Forty-fourth street and Lexington avenue; also between the United States public stores at Christopher and Washington streets and the United States custom-house at Wall and William streets. These three routes were constructed and in operation under contract with the United States Government until, owing to difficulties with the New York Mail and Newspaper Transportation Company, which company had leased from the Tubular Dispatch Company the right to operate a line from the New York post-office to the Brooklyn post-office, and owing also to the default in payment of interest on a mortgage made to the Central Trust Company, receivers were appointed by the supreme court, and the property and franchises of the company were sold under foreclosure. The Tubular Dispatch Company has now been succeeded by the New York Pneumatic Service Company.

The permits granted in 1897 by the department of public works to the company provided that 2 per cent of the gross receipts of the company should be paid to the city of New York, and for the years 1898 to 1904, inclusive, the percentage was paid as so provided.

Under date of February 8, 1906, the corporation counsel advised the then commissioner of water supply, gas, and electricity of the city of New York that it would be against public policy to recognize as valid the permits granted in 1897 and 1898, which were not acted upon by the company.

NEW YORK MAIL AND NEWSPAPER TRANSPORTATION COMPANY.

The Mail Company was incorporated by special act of the legislature, chapter 164 of the Laws of 1893. Section 1 of said chapter reads in part as follows:

"The general purpose of such corporation shall be, and it is hereby, authorized and empowered to construct, maintain, and operate pneumatic tubes and other devices for the speedy transmission and delivery of the mails, newspapers, and parcels within and between the cities of this State * * * ."

Section 5 reads in part as follows:

"The said corporation is hereby empowered, without other or further authority of law or ordinance, to do any or all of the following: To locate, to construct, to maintain, and to operate tubes not to exceed 3 feet in diameter between the central post-offices and the branch post-offices and newspaper offices and postal stations in said cities of this State by such route or routes as shall be determined by said corporation and to transmit and to supply power along any or all of its route or routes and to make connections with and between said post-offices and buildings in which newspapers are published and other buildings, railways, ferries, and postal stations within and between the cities of this State, and to convey and transport and to deliver the United States mails, newspapers, and parcels * * * ."

Section 6 of said act reads as follows:

"Said corporation shall pay annually into the treasury of the cities of New York and Brooklyn, on or before October 1, in equal parts, share and share alike, a sum equal to 3 per cent of its gross earnings in said city for the preceding calendar year, or a sum equal to $1 for every 100 yards of tubes constructed and operated by it in said city."

Section 7 reads in part as follows:

"Nothing in this act shall be construed to authorize such corporation to open the streets of the city of New York for the purpose of laying pneumatic

tubes except with the consent of the mayor or the commissioner of public works of the city of New York, but such consent shall not be necessary for repairs or for connections not to exceed in the length of any connection a distance greater than the length of 4 city blocks of maximum size."

It appears the company did not operate under the foregoing franchise until November, 1897, and in an action brought by W. H. Bliss and others against the Tubular Dispatch Company, New York Mail and Newspaper Transportation Company, and others for an accounting by Des Passes Brothers, attorneys for plaintiff, it is stated that until November, 1897, the Mail Company was a mere paper corporation; that from November, 1897, to the summer of 1898, tubes were constructed from the New York general post-office to the Brooklyn Bridge for the Tubular Dispatch Company, but in February, 1898, said tubes were sold to the New York Mail and Newspaper Transportation Company. On December 31, 1897, the Mail Company entered into a contract, modifying its former contracts of March, 1896, and March, 1897, which last agreement with the trustees of the New York and Brooklyn Bridge permitted the company to lay its tubes over the Brooklyn Bridge for a period terminating March 1, 1922. The agreement with the trustees of the bridge requires the company to pay $1,001 per annum.

On November 10, 1902, there was issued by the department of water supply, gas, and electricity, a general permit to take up pavement at numerous streets. This permit was signed by the commissioner of water supply, gas, and electricity and Jacob A. Cantor, borough president, and was indorsed "Approved, Seth Low, Mayor." In 1906, the engineers of the city reported that no work of construction had been done under this permit.

Until 1902 the contracts with the United States Government for the operation of the pneumatic-tube circuits in the city were made with the Tubular Dispatch Company, but on August 1, 1902, the Tubular Dispatch Company leased to the Mail Company all of its plant, property, and franchises for the term of three years from the date of a contract to be entered into by the Mail Company with the United States Government. Said lease provided that if the contract with the United States Government was for four years, the lease from the Tubular Dispatch Company to the Mail Company should be continued for an additional year.

Under date of June 12, 1906, the corporation counsel advised the then commissioner of water supply, gas, and electricity that the said company had legally offered to lay pneumatic tubes in the streets of the city.

The mortgage foreclosure sale of the property and franchise of the Tubular Dispatch Company took place on the 5th of June, 1906, and the property was purchased by W. E. L. Dillaway, president of the American Pneumatic Service Company.

On June 29, 1906, the New York Pneumatic Service Company was incorporated according to the Financial Chronicle (vol. 83, p. 1102) as the successor of the Tubular Dispatch Company, and on October 16, 1906, took possession of the property of that company. The Financial Chronicle further stated, at page 34 of such volume, that the receipts of the New York Mail and Newspaper Transportation Company from September, 1902, to June, 1906, were in excess of $100,000 annually.

As stated in the above communication of the commission, the Postmaster-General has contracted with the New York Pneumatic Service Company in the cities of New York and Brooklyn for a period of ten years commencing November 1, 1906, and ending June 30, 1916.

Under date of September 18, 1906, the corporation counsel advised the comptroller that the New York Mail and Newspaper Transportation Company, under the terms of its franchise, could pay either a sum equal to the sum of 3 per cent of its gross earnings for the preceding calendar year, or a sum equal to $1 for every 100 yards of tubes constructed and operated by it in said city. Payment has been made by the company on the latter basis, which yields the city a small sum compared to that which it would receive if it received a percentage of the gross receipts.

The foregoing comprises all the information on file in this office on the subject of pneumatic-tube mail service in the city of New York.

Complying with the request contained in the above communication to "be furnished with a copy of existing laws and ordinances relative to the granting of franchises," I herewith quote the sections of the Greater New York

charter (New York Laws of 1901, chap. 466) applicable thereto, in so far as they are of interest in this connection:

"SEC. 71. The rights of the city in and to its water front, ferries, wharf property, land under water, public landings, wharves, docks, streets, avenues, parks, and all other public places are hereby declared to be inalienable.

"SEC. 72. Every grant of or relating to a franchise of any character to any person or corporation must, unless otherwise provided in this act, be by ordinance of the board of aldermen or by resolution of the board of estimate and apportionment or a contract executed by or under the authority of the said board of estimate and apportionment, provided that every such ordinance, resolution, or contract shall be subject to the provisions of this act with respect to approval by the mayor. But this section shall not apply to any franchise, right, or contract authorized by the board of rapid transit railroad commissioners of the city of New York.

"SEC. 73. After the approval of this act, no franchise or right to use the streets, avenues, waters, rivers, parkways, or highways of the city shall be granted by any board or officer of the city of New York under the authority of this act to any person or corporation for a longer period than twenty-five years, except as herein provided, but such grant may, at the option of the city, provide for giving to the grantee the right on a fair revaluation or revaluations to renewals not exceeding in the aggregate twenty-five years. * * * At the termination of any franchise or right granted by the board of estimate and apportionment all the rights or property of the grantee in the streets, avenues, waters, rivers, parkways, and highways shall cease without compensation. Every such grant of a franchise and every contract made by the city in pursuance thereof may provide that upon the termination of the franchise or right granted by the board of estimate and apportionment the plant of the grantee, with its appurtenances, shall thereupon be and become the property of the city without further or other compensation to the grantee; or such grant and contract may provide that upon such termination there shall be a fair valuation of the plant which shall be and become the property of the city on the termination of the contract on paying the grantee such valuation. If by virtue of the grant or contract the plant is to become the city's without money payment therefor, the city shall have the option either to take and operate the said property on its own account, or to lease the same for a term not exceeding twenty years. If the original grant shall provide that the city shall make payment for the plant and property, such payment shall be at a fair valuation of the same as property, excluding any value derived from the franchise; and if the city shall make payment for such plant it shall in that event have the option either to operate the plant and property on its own account or to lease the said plant and property and the right to the use of streets and public places in connection therewith for limited periods, in the same or similar manner as it leases the ferries and docks. Every grant shall make adequate provision by way of forfeiture of the grant, or otherwise, to secure efficiency of public service at reasonable rates and the maintenance of the property in good condition throughout the full term of the grant. The grant or contract shall also specify the mode of determining the valuation and revaluations therein provided for.

"SEC. 74. Before any grant of the franchise or right to use any street, avenue, waterway, parkway, park, bridge, dock, wharf, highway, or public ground or water within or belonging to the city shall be made by the board of estimate and apportionment, the proposed specific grant embodied in the form of a contract, with all of the terms and conditions, including the provisions as to rates, fares, and charges, and, together with the form of the resolution or resolutions for the granting of the same, shall be entered in the minutes of the board of estimate and apportionment and after such entry shall be published at least twenty days in the city record and at least twice in two daily newspapers published in the city, to be designated by the mayor, at the expense of the proposed grantee. The board of estimate and apportionment shall, before authorizing any such contract or adopting any such resolution, set a date or dates for a public hearing thereon at which citizens shall be entitled to appear and be heard. No such hearing shall be held, however, until notice thereof shall have been published for at least ten days immediately prior thereto in the city record and at least twice in two daily newspapers published in the city, to be designated by the mayor, at the expense of the proposed grantee,

and the said board of estimate and apportionment, before authorizing any such contract or adopting any such resolution, shall make inquiry as to the money value of the franchise or right proposed to be granted and the adequacy of the compensation proposed to be paid therefor, and publish the results of such inquiry at least ten days in the city record and at least twice in the daily newspapers in which such form of contract shall be published. Every such contract or resolution shall be entered on the minutes or record of such board of estimate and apportionment, and every contract or resolution containing or making such grant shall require the concurrence of members of the board of estimate and apportionment entitled, as provided by law, to three-fourths of the total number of votes to which all the members of the said board shall be entitled, and the votes shall be shown by the ayes and noes as recorded in the minutes of the board. Thirty days at least shall intervene between the introduction and final passage of any such resolution or authorization of such contract. The separate and additional approval of the mayor shall be necessary to the validity of every such contract or resolution. This act shall apply to any renewal or extension of the grant or leasing of the property to the same grantee or to others. Within five days after the adoption of any such resolution or any such authorization a copy thereof, including the full text of the franchise, grant, or contract, and duly attested by the clerk of the board of estimate and apportionment, shall be transmitted to each of the following: The comptroller, the corporation counsel, the city clerk, and the board of rapid-transit railroad commissioners of the city of New York, to be preserved by them among the archives of their departments or office. All such certified copies shall be deemed to be public records.

"SEC. 75. The board of alderman may, from time to time, with respect to any grant which that board shall, under the authority of this act, have the exclusive power to make, pass appropriate ordinances, not inconsistent with the constitution and laws of the State, to carry the provisions of this title into effect, but shall not part with the right and duty at all times to exercise, in the interest of the public, full municipal superintendence, regulation, and control in respect of all matters connected with such grant, and not inconsistent with the terms thereof."

As to the general powers of the board of estimate and apportionment over the streets, see section 242 of the charter (as amended by Laws, 1905, chap. 629).

POST-OFFICE DEPARTMENT,
SECOND ASSISTANT POSTMASTER-GENERAL,
DIVISION OF RAILWAY ADJUSTMENTS,
Washington, September 28, 1908.

Hon. WILLIAM R. WILLCOX,
Chairman Public Service Commission,
Tribune Building, New York, N. Y.

SIR: The commission appointed by the Postmaster-General to investigate and report to him with reference to the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic tube mail service and operating the same, etc., appointed a subcommittee to take up the investigation and details of the inquiry as provided by law. Accordingly, we have to submit to you the following:

The Postmaster-General has contracted with the New York Pneumatic Service Company, a corporation organized under the laws of the State of New York, for the installation of pneumatic tubes and necessary power plants and operating machinery and the operation of pneumatic tube mail service as contractor with the United States in the cities of New York and Brooklyn, for the period from November 1, 1906, to June 30, 1916.

In the act of March 27, 1908, making appropriations for the service of the Post-Office Department for the fiscal year ending June 30, 1908, Congress provided as follows:

"And the Postmaster-General is hereby authorized and directed to investigate and report to Congress not later than January 1, 1909, the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube service, and thereafter operating the same in the cities where such service is now in operation, and also ascertain and report the approximate cost of

purchase and likewise of installation and the cost of maintenance and operation."

The question has arisen as to the probability of installing pneumatic tubes for mail purposes in existing or proposed subways in New York and Brooklyn, and we desire to be informed what the probable attitude of the public service commission would be toward such installation and operation and, if such installation were regarded as practicable and desirable, under what conditions such installation would be allowed by the public service commission and how the permission to install such tubes would be obtained.

As our report to the Postmaster-General must be made at an early date, I have the honor to request as early a reply as practicable.

Very respectfully,

JOSEPH STEWART,
Chairman Subcommittee Pneumatic Tube Commission.

STATE OF NEW YORK,
PUBLIC SERVICE COMMISSION FOR THE FIRST DISTRICT,
New York, October 15, 1908.

JOSEPH STEWART, Esq.,
Chairman Subcommittee Pneumatic Tube Commission,
Division of Railway Adjustments,
Washington, D. C.

DEAR SIR: Under date of September 28 you addressed a communication to this commission asking to be informed as to the probable attitude of the commission with respect to the matter of construction and installation of pneumatic mail tubes in existing and proposed subways, which was acknowledged on September 30. The matters presented in your communication were referred for advice to the chief engineer and to the counsel of this commission, and they have rendered opinions thereon to the commission, which has directed me to inform you of their conclusions, which I can perhaps best do by quoting their opinions in full.

The chief engineer's communication is as follows:

"TRAVIS H. WHITNEY, Esq.,
"*Secretary Public Service Commission.*

"INSTALLATION OF MAIL TUBES IN SUBWAYS.

"DEAR SIR: In reply to your communication of September 30, in reference to the installation of mail tubes in existing or proposed subways in New York and Brooklyn, I would say that it is very questionable whether available space exists for such tubes in the subways constructed under contracts 1 and 2, except in the section crossing the East River from the Battery.

"In these subways the clearances are very small, and difficulties in locating a line of tubes of the size used in the mail service would be multiplied many times by the signals used in operation of the railroads, existing lines for distribution of compressed air, and electricity.

"The structure containing the Rapid Transit Railroad being under lease to the Interborough, it would probably be necessary to obtain the consent of the railroad company for the installation of the mail tubes, should such an installation be deemed desirable.

"In the case of the Brooklyn loop lines in Manhattan, now under construction, the clearances are greater than in the subways now in operation, and space sufficient for the mail tubes exists, although such a location of the tubes would not be advantageous for their maintenance.

"In the case of pipe galleries under construction or to be constructed, there would be no difficulty in locating the mail tubes in the pipe galleries. The only pipe galleries now under contract for construction are those to be built on Delancey street and Delancey street extension from Cleveland place to Essex street, and should it be deemed desirable to place mail tubes in these galleries the fact should be determined as early as possible, so that in fixing the location of pipes to be placed in the galleries, which is now being done, provision for the mail tubes could be taken into consideration.

"Yours very truly,

"HENRY B. SEAMAN,
"*Chief Engineer.*"

The counsel's communication is as follows:

"OCTOBER 12, 1908.

"PUBLIC SERVICE COMMISSION FOR THE FIRST DISTRICT.

"SIRS: I have the secretary's letter of September 30 embodying a letter dated September 28 from Joseph Stewart, chairman of the subcommittee of the pneumatic tube commission, and I am also in receipt of the secretary's letter of October 7, transmitting a copy of the chief engineer's report, dated October 3, upon the subject-matter of Mr. Stewart's letter.

"Mr. Stewart states in part in his letter:

"'The question has arisen as to the probability of installing pneumatic tubes for mail purposes in existing or proposed subways in New York and Brooklyn, and we desire to be informed what the probable attitude of the public service commission would be toward such installation and operation and, if such installation were regarded as practicable and desirable, under what conditions such installation would be allowed by the public service commission and how the permission to install such tubes would be obtained.'

"So far as the legal aspect of this question is concerned, I desire to advise you that any authority for the installation of pneumatic mail tubes must depend upon the provisions of the rapid transit act. Section 6 of the rapid transit act provides in part as follows:

"'When the consents of the local authorities and the property owners, or in lieu thereof, the authorization of the said appellate division of the supreme court upon the report of commissioners, shall have been obtained, the board of rapid transit railroad commissioners shall at once proceed to prepare detailed plans and specifications for the construction of such rapid transit railway or railways in accordance with the general plan of construction, including all devices and appurtenances deemed by it necessary to secure the greatest efficiency, public convenience and safety, including the number, location, and description of stations and plans and specifications for the suitable supports, turn-outs, switches, sidings, connections, landing places, buildings, platforms, stairways, elevators, telegraph and signal devices, and other suitable appliances incidental and requisite to what the board may approve as the best and most efficient system of rapid transit in view of the public needs and requirements * * *.'

"It seems to me that under this provision the only appliances authorized to be constructed as part of the railroad are those which are 'incidental and requisite' to the operation of the railroad, and from such information as I have it does not seem to me that the matter of pneumatic mail tubes would fall within this class. It is to be remembered also that the interest and sinking fund charges provided for in the act are to be charged upon the cost of the railroad, and in view of that provision I do not think it proper that upon the cost of the railroad should be imposed the cost of the construction of other appliances which, although undoubtedly of great public use, are not in themselves necessary for its operation.

"The rapid transit act, also, however, provides for the construction of pipe galleries, the cost of which, under section 34a, is to be deducted from the amount of bonds upon which the interest and sinking fund charges are to be paid. In regard to these galleries, section 6 in part provides that—

"'The said board may, in its discretion, include in its said plans provisions for galleries, ways, subways or tunnels for sewers, gas or water pipes, electric wires and other subsurface structures and conductors proper to be placed underground, whenever necessary so to do, in order to permit of the proper construction of any railway herein provided for in accordance with the plans and specifications of the said board, or for any other purpose in furtherance of the public interest or convenience.'

"It is further provided in section 6 that these galleries shall be maintained by the city, but should be in the care and charge of the rapid transit board and subject to such regulations as it should prescribe.

"The chief engineer in his report evidently considers it practicable to install the pneumatic mail tubes in the pipe galleries, and it seems to me that that course is proper. The pipe galleries are provided for the purpose of having placed therein all subsurface structures, except possibly those such as sewers, which would be too large to be placed therein, and it seems to me that the placing of pneumatic tubes in those galleries would be only following out the plain intent of the act.

"In regard to installing pneumatic mail tubes in the subways at present constructed, I have noted that the chief engineer, in his report, evidently con-

siders such a course impracticable, but the same legal situation to which I have referred as applied generally to subways seems to me also to apply to the ones now in operation, although further complicated by the fact that the Interborough Company is now in possession of those roads, under its contract with the city. It would, therefore, be necessary, as a first step, to have the consent of the Interborough Company to the installation of these tubes, but even if such consent were given, and such a course met with your approval, it would seem to me that additional legislation would be necessary before it would be proper to install nonrailroad structures in the subway. If such authority should be granted, and the Interborough Company consented to placing these tubes in the subway, it would then be necessary for the company operating the mail tubes to obtain from the local authorities a proper franchise.

"Mr. Stewart further asks how permission to install such tubes would be obtained. As placing the tubes in the pipe galleries seems to be the only course for which there is now authority, I think it proper that Mr. Stewart be advised that as a first step a franchise to maintain such tubes in the streets must be obtained from the board of estimate, in accordance with the provisions of the Greater New York charter, and when that franchise has been obtained application might properly be made to you for permission to place the tubes in any galleries which may have been constructed, subject to such charges and regulations as you may prescribe.

"Respectfully yours,

"GEO. S. COLEMAN,
"*Counsel to the Commission.*"

Very truly yours,

TRAVIS H. WHITNEY,
Secretary.

POST-OFFICE DEPARTMENT,
SECOND ASSISTANT POSTMASTER-GENERAL,
DIVISION OF RAILWAY ADJUSTMENTS,
Washington, September 28, 1908.

HON. FRED. A. BUSSE,
Mayor of the City of Chicago, Ill.

SIR: The commission appointed by the Postmaster-General to investigate and report to him with reference to the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube mail service and operating the same, etc., appointed a subcommittee, consisting of Messrs. Stewart, Bradley, Masten, and Norris, to take up the investigation and details of the inquiry as provided by law. Accordingly, we have the honor to submit the following:

The Postmaster-General has contracted with the Chicago Postal Pneumatic Tube Company, a corporation organized under the laws of the State of Illinois, for the installation of pneumatic tubes and necessary power plants and operating machinery and the operation of pneumatic-tube mail service as contractor with the United States in the city of Chicago for the period commencing November 1, 1906, and ending June 30, 1916. The contracting company has been requested to furnish you at once a map showing the lines contracted for, those in operation separate from those under consideration.

In the act of March 27, 1908, making appropriations for the service of the Post-Office Department for the fiscal year ending June 30, 1909, Congress provided as follows:

"And the Postmaster-General is hereby authorized and directed to investigate and report to Congress not later than January 1, 1909, the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube service, and thereafter operating the same in the cities where such service is now in operation, and also ascertain and report the approximate cost of purchase and likewise of installation and the cost of maintenance and operation."

One of the important questions for consideration of the commission, and ultimately the Postmaster-General and Congress, is the relations which exist between the United States and the municipality of Chicago, and the attitude of the latter toward the former in the matter of the performance of mail service by pneu-

matic tubes through the streets and municipalities in the event the United States should purchase the tubes now laid or install others for the direct performance of mail service thereby.

We therefore have the honor to request that we be furnished with a copy of existing laws and ordinances relative to the granting of franchises in Chicago, and such other matters of regulation as may exist relative to the installation and operation of such property in the streets. We also have to request to be informed as to your opinion regarding the application of the local ordinances respecting the franchises, etc., to the United States in the matter of the installation of pneumatic tubes and the operation of mail service through the same. In this connection we beg leave to submit for consideration our understanding with respect to the general rights of the United States in the conduct of the mail service. These general propositions may be stated as follows:

That the Constitution of the United States confers upon Congress the power "to establish post-offices and post-roads. (Constitution, Art. I, sec. 8.)

That this power granted to Congress carries with it all powers necessary to make it effective.

That all the streets of a city like Chicago over which letter-carrier routes are established are post routes under the law.

That the conduct of the postal business by the Post-Office Department is a governmental function.

That any statute or ordinance which imposes any restriction on the free exercise of this function other than to make the agents of the Government subject to the local police regulations or the police power of the State will have no effect as against the United States.

As our report to the Postmaster-General must be made at an early day, I have the honor to request as early a reply as practicable.

Very respectfully,

JOSEPH STEWART,
Chairman Subcommittee Pneumatic Tube Commission.

UNITED STATES POST-OFFICE,
Chicago, Ill., October 8, 1908.

Hon. JOSEPH STEWART,
Second Assistant Postmaster-General,
Washington, D. C.

MY DEAR SIR: The inclosed papers were sent to me by Mayor Fred A. Busse, of Chicago, with a request that I forward same to you.

Respectfully,

D. A. CAMPBELL, *Postmaster.*

CITY OF CHICAGO, LAW DEPARTMENT,
OFFICE OF THE CORPORATION COUNSEL,
Chicago, Ill., October 5, 1908.

Hon. FRED. A. BUSSE,
Mayor City of Chicago.

DEAR SIR: We return herewith letter addressed to you from the office of the Second Assistant Postmaster-General by Joseph Stewart, chairman, subcommittee pneumatic tube commission, which you referred to this department.

We also inclose copy of an ordinance passed by the city council July 13, 1903 (council proceedings, 794), granting to the Chicago Postal Pneumatic Tube Company the right and privilege of laying, maintaining, and operating pneumatic tubes in the streets and alleys in the city for a period of twenty years from and after the acceptance of the ordinance. We are advised that the ordinance was accepted October 12, 1903.

On page 777 of the council proceedings, 1903–4, July 6, 1903, there can be found an order passed by the council specifying the streets and alleys in which this company was permitted to construct and maintain its tubes.

As to the legal provisions mentioned in the letter of Mr. Stewart, we submit the following:

The city is organized and existing under and by virtue of the provisions of the act to provide for the incorporation of cities and villages, approved April 10, 1872, and the amendments thereto.

By various provisions of article 5 of that act, the city council is given power to lay out, establish, grade, pave, or otherwise improve streets and alleys, to regulate the use of the same, to prevent and remove encroachments or obstructions upon the same, to provide for the cleansing of the same, to regulate the use of sidewalks and all structures thereunder, and, speaking generally, to do anything and everything with the streets and alleys that will promote the public convenience. Under this statute the city clearly has ample right to authorize the construction, maintenance, and operation of pneumatic tubes for transmission of the mails, and in granting this right the city can impose such restrictions as to it may seem proper.

In this State a city can not grant any franchise, but its power is simply to grant a license, which is quite a different thing from a franchise.

No individual or corporation can construct or maintain any pneumatic tubes or any other thing in, on, or under the streets or alleys of the city without first obtaining a license from the city.

The Constitution of the United States has given Congress the power to establish post-roads, and the public streets within this city are post-roads, and the power of Congress over those streets is supreme while used as post-roads.

It has been judicially determined that a public street is not a post-road excepting at the particular instant when the mail is being transported over it. In these days, since the installation of pneumatic-tube service, it is quite probable that the courts would allow the Federal Government to maintain those tubes, even though they should not be constantly in use.

Yours, very truly,

WM. D. BARGE,
Assistant Corporation Counsel.

Approved:
EDWARD J. BRUNDAGE,
Corporation Counsel.

AN ORDINANCE Granting to the Chicago Postal Pneumatic Tube Company certain rights and privileges in regard to pneumatic tubes in the city of Chicago.

Be it ordained by the city council of the city of Chicago:

GRANT.

SECTION 1. Subject to the terms and conditions of this ordiannce, there is hereby granted to the Chicago Postal Pneumatic Tube Company, a corporation duly organized and existing under the laws of the State of Illinois, permission and authority to construct, lay, place, maintain, and operate pneumatic tubes, not to exceed two tubes for each route from place to place, the maximum size of such tubes to be eight (8) inches inside diameter occupying cross section, including switches, turn-outs, and connections, approximately two hundred and seventy-five (275) square inches, with all suitable switches, turn-outs, and connections with such electrical or other connections as are absolutely necessary for the operation of said switches, turn-outs, and connections in, through, upon, and under the streets, avenues, alleys, public ways, tunnels, bridges, viaducts, and under the Chicago River and its various branches within the city of Chicago, said electrical connections not to exceed four wires from the central post-office station to each switch; the rights and privileges granted under this ordinance are upon the express condition that said pneumatic tubes are to be laid on only such streets, avenues, alleys, public ways, tunnels, upon viaducts, and under the Chicago River and its various branches at such points within the city of Chicago as may be necessary to connect the temporary and main post-office buildings in said city with branch post-offices, subpostal stations, and steam railway stations, said tubes to be constructed of cast iron, steel, or brass, capable of withstanding a pressure of one hundred (100) pounds per square inch, the maximum working pressure not to exceed twenty (20) pounds per square inch.

Before any permit shall be issued to open any street, alley, or public way for the installation of tubes under this ordinance, a map or plat of the route adopted and streets or alleys to be occupied shall be presented to the city council for its approval, and no permit shall be issued until such plat or plats or map or maps shall be approved by the city council.

USE.

SEC. 2. Said pneumatic tubes, with all switches, turn-outs, and connections, shall be used for the transmission by compressed air or such other power as may be hereafter authorized, of United States mail only, and for no other purpose whatever, and this grant shall become null and void if said pneumatic tubes be ever used for any other purpose than carrying United States mails.

UNDERGROUND PLANS.

SEC. 3. All such lines of pneumatic tubes shall be placed underground except those which must necessarily pass through, over, upon or under tunnels, railroads, elevated railroads, bridges, or viaducts. Such company shall at all times place and keep on file with the commissioner of public works plans showing the location of each pneumatic-tube switch, turn-out, and connection, and upon laying any pneumatic tubes said company shall file with the commissioner of public works a plan showing where each of the same is laid, the location of manholes or other openings to gain access thereto, and each cover of said openings shall have placed thereon the name of said company. Said pneumatic tubes, branches, connections, switches, and other parts shall be laid and constructed along the route as shown on the map or plat approved by the city council as hereinbefore provided and in accordance with the plans approved by the commissioner of public works as hereinbefore provided, and said work shall be done to the satisfaction of the commissioner of public works: *Provided, however,* That when said company shall lay its line or lines of pipes or tubes, or any part thereof, below the surface of the ground or through a tunnel, the same shall be laid in such part of the street, avenue, alley, tunnel, or other public highway as the commissioner of public works shall direct, and without doing permanent injury to any street, avenue, alley, sidewalk, tunnel, or other public place, or in a manner to unnecessarily disturb or interfere with any water pipe, gas pipe, sewer, conduit, subway, or other underground work laid by the said city or any authorized company or corporation. And if, in the opinion of the commissioner of public works, it becomes necessary for the grantee herein to change or remove any water pipe, gas pipe, sewer, conduit, subway, or other underground work laid by the said city or any authorized company or corporation, the said grantee shall change or remove any such underground work entirely at its own expense. Whenever said line or lines of pipes cross any street at an angle, said street shall be repaved or restored by the said company to such width and in such manner as shall be directed by the commissioner of public works, and in such manner as shall be directed by the commissioner of public works, and the material shall be the same as the material of the remaining portion of the street, avenue, or alley in the same block, all such paving to be done at the expense of the said company in a first-class manner and to the satisfaction of the commissioner of public works.

TIME FOR LAYING TUBES.

SEC. 4. The work of laying said pneumatic tubes and other appliances connected therewith, herein authorized, shall be begun within six (6) months after the passage of this ordinance, and at least eight (8) miles of double tubes shall be constructed and completed within one year from said passage, and any work for which a permit may be granted under this ordinance at any time hereafter must be completed within one (1) year from the issuance of said permit: *Provided,* That if the said company shall be restrained or prevented from proceeding with the work in laying said tubes, branches, connections, and other appliances connected therewith, by order or writ of any court of competent jurisdiction, or by the action of the city of Chicago or its duly constituted authorities, the time which said company shall be so delayed shall be added to the time herein prescribed for the completion of said work. The city of Chicago, however, shall have, and it hereby expressly reserves, the right to intervene in any suit or proceeding brought by any person or persons seeking to enjoin, restrain, or in any manner interfere with the prosecution of said construction and in the name of said company move for a dissolution of such injunction or restraining order and for any proper order in such suit in case it shall deem such suit collusive or brought for the purpose of delay or for the purpose of extending the time herein prescribed for the completion of the laying of said pneumatic tubes.

INJURY TO STREETS.

SEC. 5. Said company shall not open, disturb, or encumber more of any street, avenue, alley, or public place at any time than shall be necessary to enable it to proceed with advantage in the laying in any street, avenue, alley, or public place of its said pipes or tubes, nor shall said company permit any such street, avenue, alley, or public place to remain open or encumbered for a longer period than shall be necessary to execute the work for which the same shall have been opened or encumbered, and without putting up the necessary barriers and lights so as to effectually prevent the happening of any accident in consequence of such opening or encumbering of such street, avenue, alley, or public place.

REPAIRING STREETS.

SEC. 6. Whenever said corporation shall repair any street, avenue, alley, or public highway, it shall put down pavement of such material and quality, and such material shall be the same as the remaining portion of the street, avenue, alley, or public highway in the same block is constructed of, and in which said opening is made, and in such manner as existed before said street was disturbed. Before a permit shall be granted to said company to open ground in any street, sidewalk, alley, avenue, or public place for any purpose, an estimate of the cost of the necessary repairing of said street, sidewalk, alley, avenue, or public place with a fair additional sum as margin for contingent cost, shall be made by the commissioner of public works, and the said applicant corporation shall deposit the amount so ascertained with the city comptroller, and the permit shall issue to said company only upon the presentation of the comptroller's receipt for the same to the commissioner of public works; such deposit shall remain with the city comptroller for the period of one year, at which time, upon the presentation of a certificate from the commissioner of public works, certifying to the satisfactory condition of such restored pavement, said deposit shall be returned to said corporation, and no work of any kind shall be done by said company without a permit from the commissioner of public works. No excavation in any street, avenue, alley, or other public place shall be made without first procuring a permit for that purpose from the commissioner of public works of the said city of Chicago.

CHANGING OR REMOVING TUBES.

SEC. 7. The said company shall, on notice from the commissioner of public works, remove or change any of its pipes or tubes which may be in the way of, or interfere with, the construction or location of any viaduct, public building, or other public structure, or any public or private undertaking, or shall interfere with the lowering of the tunnels under the Chicago River.

SUBWAY.

SEC. 8. Whenever the said city of Chicago, or the State of Illinois, or any person, firm, or corporation acting under a franchise from the city of Chicago, in and by which franchise the city of Chicago shall retain and control the right to fix the rentals and conditions for the use of a subway, shall construct or form, or cause to be constructed or formed, into a general subway, any street, avenue, alley, or place, or any part or parts thereof, on or through which any such pneumatic tubes authorized by this ordinance shall be located; the said company, on due notice from the mayor or commissioner of public works, shall remove into and occupy said subway, change, and maintain its said pipes, tubes, or other appurtenances therein at its own expense, and said company shall comply in every respect with all the laws and ordinances that shall be passed concerning rentals for space in said subway and the general occupancy thereof, and shall pay such rental as shall be provided by said ordinance.

TERM OF GRANT—RIGHT OF PURCHASE.

SEC. 9. The rights and privileges hereby conferred upon said company are granted for the term of twenty (20) years from and after the acceptance of this ordinance. Such rights and privileges are hereby granted on the express condition that at any time after the term of ten (10) years from and after the acceptance of this ordinance the city of Chicago shall have the right to

purchase the entire plant or plants of said company and all its property and effects of every kind or nature within said city of Chicago, either by mutual agreement or at an appraised value, which appraised value shall be ascertained and determined by three (3) competent and disinterested appraisers, who shall have full access to all books, papers, and other documents of said company bearing on or appertaining to the subject, and such appraisers shall be selected in the following manner, to wit: One of said appraisers shall be appointed by the city of Chicago, one by said company, and the two so selected shall choose the third; and if said two appraisers can not agree upon a third, then said third appraiser shall, by petition of either party in interest, be selected by the chief justice of the circuit court of Cook County; and the said three appraisers, when so chosen, shall, within six months after the appointment of the last appraiser, make report in writing to the said city of Chicago of the value of the said property; the value of this license or grant is not to be taken into account or considered of any value as against the city of Chicago, and the said city of Chicago shall have the option at any time within one year after the receipt of said report to purchase said plant or plants and property, together with all its appurtenances and equipment, at the aforesaid value so fixed by said appraisers: *Provided, however*, That if said city shall so elect to purchase said plant or plants and property, then said company shall have the right to operate said plant or plants and property and receive the profits therefrom during the time said arbitration is in progress and until the same shall be completed and the purchase price, as fixed by the arbitrators, has been paid.

In the event of the grantee hereunder not receiving the mail carrying contract from the United States Government at the expiration of any of its contracts with the United States Government, then and in that event the city of Chicago shall have the right, and the right is hereby expressly reserved, to require the grantee hereunder to sell to any person, firm, or corporation which shall receive from the United States Government the contract for carrying mails in the city of Chicago by pneumatic tubes, all its plant which may occupy the public streets, alleys, or other public grounds on the same terms and in the same manner as is herein provided for its purchase by said city, and the value of this license or grant is not to be taken into account or considered of any value as against such person, firm, or corporation receiving said contract.

At the expiration of this grant all the tubes of this grantee then in the streets, alleys, or other public grounds shall be and become the absolute property of the city of Chicago, and this grantee hereby and in consideration of these presents agrees to convey the said tubes free of all liens or incumbrances by proper deed of conveyance to the city of Chicago, or to any person, firm, or corporation that may be selected by said city of Chicago.

BOND.

SEC. 10. On the acceptance of this ordinance the grantee shall deposit with the city treasurer the sum of fifty thousand dollars ($50,000) in cash, or negotiable securities in the sum of $50,000, to be approved by the comptroller of the city of Chicago, which deposit is for the purpose of guaranteeing the completion of the first eight miles of pneumatic tubes within one year from the passage of this ordinance, as provided for in section 4 hereof, and if the aforesaid provision is complied with then said deposit is to be returned to the grantee; otherwise this money shall be forfeited to the city of Chicago, and all the rights and privileges granted hereby shall become null and void. The company shall also file with the city of Chicago a good and sufficient bond, with sureties to be approved by the mayor, in the penal sum of fifty thousand dollars ($50,000) conditioned that said company shall comply with all the terms and conditions of this ordinance, and shall indemnify and save harmless the city of Chicago against and from any and all liability, damages, decrees, and costs of whatever kind or nature by reason of the passage of this ordinance and the exercise of any rights and privileges hereby or herein granted. Whenever in the opinion of the proper officers of the said city of Chicago the said bond may have been impaired by reason of change in the financial condition of the sureties upon the same, the said city of Chicago may require said company, within a reasonable time, to furnish another bond conditioned in the same manner with such sureties as may be approved by the mayor of said city of Chicago, and in case of failure of said company to furnish said bond after due notice all the rights of such company under this ordinance shall cease and the same shall be void.

PAYMENTS.

SEC. 11. The rights and privileges hereby granted are upon the express condition that the Chicago Postal Pneumatic Tube Company shall pay annually to said city of Chicago, for and in consideration of the rights and privileges hereby granted, an amount equal to three (3) per cent per annum of the gross revenues and receipts of said company for the first four years of the life of this ordinance, and a sum equal to five (5) per cent per annum of the gross revenues and receipts of said company for the remaining sixteen years of the life of this ordinance. And in addition to said payment the grantee herein shall at the time it constructs its pipe line between Harrison street on the north and the subpostal station at or near the stock yards on the south, place in the same trench with the pneumatic tubes between said points two (2) vitrified clay conduits three (3) inches in diameter, said conduits to be installed without expense to the city of Chicago, and shall become and be the sole property of said city for its sole use. Such payments shall be made in the manner following: At the expiration of one year from the time said company shall commence to distribute mail in the city of Chicago, the president or other chief officers of the said company shall file with the comptroller of the city of Chicago a detailed statement under oath showing the amount of gross annual revenue or receipts of said company for the preceding year, and shall at the same time pay to said comptroller the percentage of the annual gross revenues and receipts of said company as hereinabove provided, said respective payments to be made as herein described, annually. Such statement, however, shall not be final or binding upon the city, and the comptroller of the city of Chicago or his authorized agent shall at all times, to verify such statement, have the right to examine the books, contracts, and papers of the said company showing the gross receipts of the said company.

WHEN IN FORCE.

SEC. 12. This ordinance shall take effect and be in force from and after its passage and the filing of the bond herein required and the acceptance in writing of this ordinance by the said company: *Provided*, That if the said bond and the said acceptance be not filed with the city clerk within ninety (90) days after the passage and approval hereof, this ordinance shall be void and of no effect.

CITY OF CHICAGO, COUNCIL CHAMBER,
Chicago, November 2, 1908.

MR. JOSEPH STEWART,
Second Assistant Postmaster-General,
Washington, D. C.

MY DEAR SIR: I have to apologize to you for the delay in sending the copies inclosed. The subject-matter in some way escaped my attention, and it was by running across your card that it was recalled to my mind. I assure you that I regret it very much.

The typewritten paper herewith is a copy of the ordinance under which the Chicago Postal Pneumatic Tube Company constructed, and is now operating, tubes in the streets of Chicago. About one year ago the company asked the city council to amend the original ordinance by striking out the last portion of section 9. The part which they sought to have stricken out was that which gave the city of Chicago the ownership of the tubes at the expiration of the grant. This did not meet with the approval of the judiciary committee in so far as it affected the tubes already installed. The committee, however, agreed upon an amendment to the ordinance which was apparently satisfactory to the representatives of the company who attended the meeting. This amendment was reported to the city council, and before it was called up for passage a communication from the company was received by his honor, the mayor, advising that the company would not accept the proposed amendment. The amendment as shown on pages 4290 and 4292 on the printed sheet was then placed on file, leaving the ordinance as it was originally passed.

Incidently I might say that the Universal Pneumatic Transmission Company is now asking the city council for a franchise to lay down and operate tubes between the post-office building, branch post-offices, subpostal stations, and

other buildings "for the purposes for which said pneumatic tubes may be employed." The request is now under consideration by the judiciary committee.

I trust you will find some information in the papers inclosed, and beg to remain,

Yours, very truly, FRANCIS D. CONNERY.

PROCEEDINGS OF THE CITY COUNCIL, CHICAGO, ILL.

Regular meeting, Monday, March 9, 1908—7.30 o'clock p. m.

OFFICIAL RECORD.

Published by authority of the city council of the city of Chicago, Thursday, March 12, 1908. At 7.30 o'clock, a quorum being present, the mayor called the council to order.

REPORTS OF VARIOUS COMMITTEES TO THE COUNCIL JUDICIARY.

The committee on judiciary submitted the following report, which was, on motion of Alderman Dever, deferred and ordered published:

CHICAGO, *March 3, 1908.*

To the Mayor and Aldermen of the City of Chicago in City Council Assembled:

Your committee on judiciary, to whom was referred (October 7, 1907, p. 1660) a communication and ordinance amending ordinance of July 13, 1903, in favor of the Chicago Postal Pneumatic Tube Company; and (November 11, 1907, p. 3156) two communications in reamending said ordinance of July 13, 1903, having had the same under advisement, beg leave to report and recommend the passage of the accompanying ordinance:

AN ORDINANCE Amending an ordinance passed by the city council of the city of Chicago on July 13, 1903, entitled "An ordinance granting to the Chicago Postal Pneumatic Tube Company certain rights and privileges in regard to pneumatic tubes in the city of Chicago."

Be it ordained by the city council of the city of Chicago:

SECTION 1. That an ordinance passed by the city council of the city of Chicago on July 13, 1903, entitled "An ordinance granting to the Chicago Postal Pneumatic Tube Company certain rights and privileges in regard to pneumatic tubes in the city of Chicago," appearing in the printed council proceedings of that date beginning on page 794, be amended by adding certain provisions to section 9 of said ordinance so that the said section 9 shall hereafter read as follows:

"SEC. 9. The rights and privileges hereby conferred upon said company are granted for the term of twenty (20) years from and after the acceptance of this ordinance. Such rights and privileges are hereby granted on the express condition that at any time after the end of ten (10) years from and after the acceptance of this ordinance the city of Chicago shall have the right to purchase the entire plant or plants of said company and all its property and effects of every kind or nature within said city of Chicago either by mutual agreement or at an appraised value, which appraised value shall be ascertained and determined by three competent and disinterested appraisers who shall have full access to all books, papers, and other documents of said company bearing on or appertaining to the subject, and such appraisers shall be selected in the following manner, to wit: One of said appraisers shall be appointed by the city of Chicago, one by said company, and the two so selected shall choose a third, and if said two appraisers cannot agree upon a third, then said third appraiser shall by petition of either party in interest be selected by the chief justice of the circuit court of Cook County, and the said three appraisers, when so chosen, shall within six months after the appointment of the last appraiser make a report in writing to the said city of Chicago of the value of the said property; the value of this license or grant is not to be taken into account or considered of any value as against the city of Chicago, and the said city of Chicago shall have the option at any time within one year after the receipt of said report to purchase said plant or plants and property, together with all its appurtenances and equipment at the aforesaid value so fixed by said appraisers; provided, however, that if said city shall so elect to

purchase said plant or plants and property, then said company shall have the right to operate said plant or plants or property and receive the profits therefrom during the time said arbitration is in progress and until the same shall be completed and the purchase price, as fixed by the arbitrators, has been paid.

"In the event of the grantee hereunder not receiving the mail carrying contract from the United States Government at the expiration of any of its contracts with the United States Government, then and in that event the city of Chicago shall have the right, and the right is hereby expressly reserved to require the grantee hereunder to sell to any person, firm, or corporation which shall receive from the United States Government the contract for carrying mails in the city of Chicago by pneumatic tubes, all its plant which may occupy the public streets, alleys, or other public grounds on the same terms and in the same manner as is herein provided for its purchase by said city, and the value of this license or grant is not to be taken into account or considered of any value as against such person, firm, or corporation receiving said contract.

"At the expiration of this grant all the tubes of this grantee then in the streets, alleys, or other public grounds shall be and become the absolute property of the city of Chicago, and this grantee hereby and in consideration of these presents agrees to convey the said tubes free of all liens or incumbrances by proper deed of conveyance to the city of Chicago or to any person, firm, or corporation that may be selected by said city of Chicago.

"*Provided, however,* That if the city of Chicago or the United States of America shall elect to purchase under the provisions of this ordinance the entire plant or plants of said company and all its property and effects of every kind and nature within said city of Chicago, it shall include all pneumatic tubes, switches, turn-outs, and connections with such electrical or other appliances, devices, or contrivances necessary for the operation of such tubes, switches, turn-outs, and connections now in or which may hereafter be in, through, under, or upon the streets, avenues, alleys, rivers, or public grounds of the city of Chicago, or in, through, under, or upon private premises under and by virtue of any deeds, grants, leases, licenses, or permits, and all its other property and effects of every kind and nature whatsoever and including a proper assignment and transfer of all deeds, grants, leases, licenses, or permits of every kind and nature whatsoever, meaning and intending hereby to give to said city of Chicago or the United States of America the right to purchase the entire property of the grantee useful or necessary for the proper maintenance and operation of the plants, tubes, and connections installed in the city of Chicago by virtue of the grant herein contained.

Provided further, however, That if within six (6) months from the expiration of its franchise the grantee herein is still exercising the privileges of the grant herein contained and is operating the pneumatic tube system herein provided for, they may serve notice upon the then mayor of the city of Chicago stating that they wish to purchase the tubes that are in the streets, alleys, or other public grounds of the city of Chicago and were in at the time of the acceptance of this amendment, and which are fully indicated by the map attached hereto, marked "Exhibit A" and made a part hereof; and that they are willing to pay therefor the appraised value thereof, and shall in said notice nominate one disinterested man to act as appraiser; it shall thereupon become the duty of the city of Chicago to cooperate with the said grantee for the selection of three (3) competent and disinterested appraisers in the same manner as heretofore provided in this section, which said appraisers shall immediately proceed to appraise the value of all the tubes belonging to the grantee herein now in the streets, alleys, or other public grounds in the city of Chicago, and constituting the present system of the grantee herein and indicated on the map attached hereto, but not as a part of any extensions hereafter installed, but as a separate, complete going system consisting of nine miles, more or less, as shown by the map hereto attached, and after such appraisement has been completed, and within ninety (90) days after their appointment, they shall submit to the mayor of the city of Chicago and the said grantee, their detailed report in writing fixing the value of the tubes of the said grantee indicated on the map attached hereto, and the said grantee herein shall, within ten (10) days from the date of the report of said appraisers so filed, pay to the city of Chicago in cash the full amount of such appraisement as for and in full consideration and release of the rights of the said city of Chicago to be the absolute owner of all the tubes of said grantee then in the streets, avenues, alleys, or other public grounds of the city of Chicago.

"*Provided further, however,* That the passage of this amendment shall not be construed as extending the period of the grant fixed in the original ordinance for the period of time at or within which the city of Chicago shall have the right to purchase the plant or plants of the grantee and all its property and effects of every kind or nature whatsoever, or in anywise changing, impairing, or modifying the rights of the city of Chicago or the rights or obligations of the grantee herein under and by virtue of the original ordinance, only and except in so far as they have been expressly changed or modified by this amendment."

SEC. 2. This ordinance shall be in effect from and after its passage and due publication: *Provided, however,* That the grantee herein shall file its acceptance in writing, and the sureties on the bond given by the grantee herein in order to guarantee the faithful performance of the provisions of this ordinance, shall file their acceptance in writing with the city clerk within thirty (30) days after the passage and due publication hereof: *Provided further, however,* That if both or either of said acceptances be not filed with the city clerk within the time fixed herein; then this ordinance shall be void and of no force or effect.

Respectfully submitted.

WILLIAM E. DEVER, *Chairman.*
JNO. R. MCCABE, *City Clerk.*

(Acceptance reported to city council October 12, 1903.)

Be it ordained by the city council of the city of Chicago:

SECTION 1. Subject to the terms and conditions of this ordinance, there is hereby granted to the Chicago Postal Pneumatic Tube Company, a corporation duly organized and existing under the laws of the State of Illinois, permission and authority to construct, lay, place, and maintain and operate pneumatic tubes, not to exceed two tubes for each route from place to place, the maximum size of such tubes to be eight (8) inches, inside diameter, occupying in cross section, including switches, turn-outs, and connections, approximately two hundred and seventy-five (275) square inches, with all suitable switches, turn-outs, and connections with such electrical or other connections as are absolutely necessary for the operation of said switches, turn-outs, and connections in, through, upon, and under the streets, avenues, alleys, public ways, tunnels, bridges, viaducts, and under the Chicago River and its various branches within the city of Chicago, said electrical connections not to exceed four wires from the central post-office station to each switch; the rights and privileges granted under this ordinance are upon the express condition that said pneumatic tubes are to be laid on only such streets, avenues, alleys, public ways, tunnels, upon viaducts, and under the Chicago River and its various branches at such points within the city of Chicago as may be necessary to connect the temporary and main post-office buildings in said city with branch post-offices, subpostal stations, and steam railway stations, said tubes to be constructed of cast iron, steel, or brass, capable of withstanding a pressure of one hundred (100) pounds per square inch, the maximum working pressure not to exceed twenty (20) pounds per square inch.

Before any permit shall be issued to open any street, alley, or public way for the installation of tubes under this ordinance, a map or plat of the route adopted and streets or alleys to be occupied shall be presented to the city council for its approval, and no permit shall be issued until such plat or plats or map or maps shall be approved by the city council.

SEC. 2. Said pneumatic tubes, with all switches, turn-outs, and connections shall be used for the transmission by compressed air, or such other power as may be hereafter authorized, of United States mail only, and for no other purpose whatever, and this grant shall become null and void if said pneumatic tubes be ever used for any other purpose than carrying United States mails.

SEC. 3. All such lines of pneumatic tubes shall be placed under ground, except those which must necessarily pass through, over, upon, or under tunnels, railroads, elevated railroads, bridges, or viaducts. Such company shall at all times place and keep on file with the commissioner of public works plans showing the location of each pneumatic tube, switch, turn-out, and connection, and, upon laying any pneumatic tubes, said company shall file with the commissioner of public works a plan showing where each of the same is laid, the location of

manholes or other openings to gain access thereto, and each cover of said openings shall have placed thereon the name of said company. Said pneumatic tubes, branches, connections, switches, and other parts shall be laid and constructed along the route as shown on the map or plat approved by the city council, as hereinbefore provided, and in accordance with the plans approved by the commissioner of public works as hereinbefore provided, and said work shall be done to the satisfaction of the commissioner of public works: *Provided, however*, That when said company shall lay its line or lines of pipes or tubes, or any part thereof, below the surface of the ground or through a tunnel, the same shall be laid in such part of the street, avenue, alley, tunnel, or other public highway as the commissioner of public works shall direct, and without doing permanent injury to any street, avenue, alley, sidewalk, tunnel, or other public place, or in a manner to unnecessarily disturb or interfere with any water pipe, gas pipe, sewer, conduit, subway, or other underground work laid by the said city or any authorized company or corporation. And if, in the opinion of the commissioner of public works it becomes necessary for the grantee herein to change or remove any water pipe, gas pipe, sewer, conduit, subway, or other underground work laid by the said city or any authorized company or corporation, the said grantee shall change or remove any such underground work entirely at its own expense. Whenever said line or lines of pipe cross any street at an angle said street shall be repaved or restored by the said company to such width and in such manner as shall be directed by the commissioner of public works, and the material shall be the same as the material of the remaining portion of the street, avenue, or alley in the same block, all such paving to be done at the expense of the said company in a first-class manner and to the satisfaction of the commissioner of public works.

SEC. 4. The work of laying said pneumatic tube and other appliances connected therewith, herein authorized, shall be begun within six (6) months after the passage of this ordinance, and at least eight (8) miles of double tubes shall be constructed and completed within one year from said passage, and any work for which a permit may be granted under this ordinance at any time hereafter must be completed within one (1) year from the issuance of said permit; provided, that if said company shall be restrained or prevented from proceeding with the work in laying said tubes, branches, connections, and other appliances connected therewith, by order or writ of any court of competent jurisdiction, or by the action of the city of Chicago or its duly constituted authorities, the time which said company shall be so delayed shall be added to the time herein prescribed for the completion of said work. The city of Chicago, however, shall have, and it hereby expressly reserves the right to intervene in any suit or proceeding brought by any person or persons seeking to enjoin, restrain, or in any manner interfere with the prosecution of said construction and in the name of said company move for a dissolution of such injunction or restraining order, and for any proper order in such suit in case it shall deem such suit collusive or brought for the purpose of delay or for the purpose of extending the time herein prescribed for the completion of the laying of said pneumatic tubes.

SEC. 5. Said company shall not open, disturb, or encumber more of any street, avenue, alley, or public place at any time than shall be necessary to enable it to proceed with advantage in the laying in any street, avenue, alley, or public place of its said pipes or tubes, nor shall said company permit any such street, avenue, alley, or public place to remain open or encumbered for a longer period than shall be necessary to execute the work for which the same shall have been opened or encumbered, and without putting up the necessary barriers and lights so as to effectually prevent the happening of any accident in consequence of such opening or encumbering of such street, avenue, alley, or public place.

SEC. 6. Whenever said corporation shall repair any street, avenue, alley, or public highway it shall put down pavement of such material and quality, and such material shall be the same as the remaining portion of the street, avenue, alley, or public highway in the same block is constructed of, and in which said opening is made, and in such manner as existed before said street was disturbed. Before a permit shall be granted to said company to open ground in any street, sidewalk, alley, avenue, or public place for any purpose, an estimate of the cost of the necessary repairing of said street, sidewalk, alley, avenue, or public place with a fair additional sum as margin for contingent cost, shall be made by the commissioner of public works and the said applicant corporation shall deposit the amount so ascertained with the city comptroller, and the

permit shall issue to said company only upon the presentation of the comptroller's receipt for the same to the commissioner of public works, such deposit shall remain with the city comptroller for the period of one year, at which time, upon the presentation of a certificate from the commissioner of public works certifying to the satisfactory condition of such restored pavement, said deposit shall be returned to said corporation, and no work of any kind shall be done by said company without a permit from the commissioner of public works. No excavation in any street, avenue, alley, or other public place shall be made without first procuring a permit for the purpose from the commissioner of public works of the said city of Chicago.

SEC. 7. The said company shall on notice from the commissioner of public works remove or change any of its pipes or tubes which may be in the way of, or interfere with, the construction or location of any viaduct, public building, or other public structure, or any public or private undertaking, or shall interfere with the lowering of the tunnels under the Chicago River.

SEC. 8. Whenever the said city of Chicago or the State of Illinois, or any person, firm, or corporation acting under a franchise from the city of Chicago in and by which franchise the city of Chicago shall retain and control the right to fix the rentals and conditions for the use of a subway, shall construct or form, or cause to be constructed or formed into a general subway, any street, avenue, alley, or place, or any part or parts thereof, on or through which any such pneumatic tubes authorized by this ordinance shall be located, the said company, on due notice from the mayor or commissioner of public works shall remove into and occupy said subway, change and maintain its said pipes, tubes, or other appurtenances therein at its own expense, and said company shall comply in every respect with all the laws and ordinances that shall be passed concerning rentals for space in said subway and the general occupancy thereof, and shall pay such rental as shall be provided by said ordinance.

SEC. 9. The rights and privileges hereby conferred upon said company are granted for the term of twenty (20) years from and after the acceptance of this ordinance. Such rights and privileges are hereby granted on the express condition that at any time after the end of ten (10) years from and after the acceptance of this ordinance the city of Chicago shall have the right to purchase the entire plant or plants of said company and all its property and effects of every kind or nature within said city of Chicago, either by mutual agreement or at an appraised value, which appraised value shall be ascertained and determined by three competent and disinterested appraisers, who shall have full access to all books, papers, and other documents of said company bearing on or appertaining to the subject, and such appraisers shall be selected in the following manner, to wit: One of said appraisers shall be appointed by the city of Chicago, one by said company, and the two so selected shall choose a third, and if said two appraisers can not agree upon a third, then said third appraiser shall, by petition of either party in interest, be selected by the chief justice of the circuit court of Cook County, and the said three appraisers, when so chosen, shall within six months after the appointment of the last appraiser make report in writing to the said city of Chicago of the value of the said property; the value of this license or grant is not to be taken into account or considered of any value as against the city of Chicago, and the said city of Chicago shall have the option at any time within one year after the receipt of said report to purchase said plant or plants and property, together with all its appurtenances and equipment, at the aforesaid value so fixed by said appraisers; provided, however, that if said city shall so elect to purchase said plant or plants and property, then said company shall have the right to operate said plant or plants and property and receive the profits therefrom during the time said arbitration is in progress and until the same shall be completed and the purchase price, as fixed by the arbitrators, has been paid.

In the event of the grantee hereunder not receiving the mail-carrying contract from the United States Government at the expiration of any of its contracts with the United States Government, then and in that event the city of Chicago shall have the right, and the right is hereby expressly reserved, to require the grantee hereunder to sell to any person, firm, or corporation which shall receive from the United States Government the contract for carrying mails in the city of Chicago by pneumatic tubes, all its plant which may occupy the public streets, alleys, or other public grounds on the same terms and in the same manner as is herein provided for its purchase by said city, and the value of this license

or grant is not to be taken into account or considered of any value as against such person, firm, or corporation receiving said contract.

At the expiration of this grant all the tubes of this grantee then in the streets, alleys, or other public grounds shall be and become the absolute property of the city of Chicago, and this grantee hereby and in consideration of these presents agrees to convey the said tubes free of all liens or encumbrances by proper deed of conveyance to the city of Chicago, or to any person, firm, or corporation that may be selected by said city of Chicago.

SEC. 10. On the acceptance of this ordinance the grantee shall deposit with the city treasurer the sum of fifty thousand ($50,000) dollars in cash, or negotiable securities in the sum of fifty thousand dollars, to be approved by the comptroller of the city of Chicago, which deposit is for the purpose of guaranteeing the completion of the first eight miles of pneumatic tubes within one year from the passage of this ordinance, provided for in section 4 hereof, and if the aforesaid provision is complied with, then said deposit is to be returned to the grantee; otherwise this money shall be forfeited to the city of Chicago, and all the rights and privileges granted hereby shall become null and void. The company shall also file with the city of Chicago a good and sufficient bond, with sureties to be approved by the mayor, in the penal sum of fifty thousand ($50,000) dollars, conditioned that said company shall comply with all the terms and conditions of this ordinance, and shall indemnify and save harmless the city of Chicago against and from any and all liability, damages, decrees, and costs of whatever kind or nature by reason of the passage of this ordinance and the exercise of any rights and privileges hereby or herein granted. Whenever in the opinion of the proper officers of said city of Chicago the said bond may have been impaired by reason of change in the financial condition of the sureties upon the same, the said city of Chicago may require said company, within a reasonable time, to furnish another bond conditioned in the same manner with such sureties as may be approved by the mayor of said city of Chicago, and in case of failure of said company to furnish said bond after due notice all the rights of such company under this ordinance shall cease and the same shall be void.

SEC. 11. The rights and privileges hereby granted are upon the express condition that the Chicago Postal Pneumatic Tube Company shall pay annually to said city of Chicago, for and in consideration of the rights and privileges hereby granted, an amount equal to three (3) per cent per annum of the gross revenues and receipts of said company for the first four years of the life of this ordinance, and a sum equal to five (5) per cent per annum of the gross revenues and receipts of said company for the remaining sixteen years of the life of this ordinance. And in addition to said payments the grantee herein shall, at the time it constructs its pipe line between Harrison street on the north and the subpostal station at or near the stock yards on the south, place in the same trench with the pneumatic tubes between said points two (2) vitrified clay conduits three (3) inches in diameter, said conduits to be installed without expense to the city of Chicago and shall become and be the sole property of said city for its sole use. Such payments shall be made in the manner following: At the expiration of one year from the time said company shall commence to distribute mail in the city of Chicago the president or other chief officers of the said company shall file with the comptroller of the city of Chicago a detailed statement, under oath, showing the amount of gross annual revenue or receipts of said company for the preceding year, and shall at the same time pay to said comptroller the percentage of the annual gross revenue and receipts of said company as hereinabove provided, said respective payments to be made as herein described, annually. Such statement, however, shall not be final or binding upon the city, and the comptroller of the city of Chicago or his authorized agent shall at all times, to verify such statement, have the right to examine the books, contracts, and papers of the said company showing the gross receipts of the said company.

SEC. 12. This ordinance shall take effect and be in force from and after its passage and the filing of the bond herein required, and the acceptance in writing of this ordinance by the said company; provided, that if the said bond and the said acceptance be not filed with the city clerk within ninety (90) days after the passage and approval hereof, this ordinance shall be void and of no effect.

POST-OFFICE DEPARTMENT,
SECOND ASSISTANT POSTMASTER-GENERAL,
DIVISION OF RAILWAY ADJUSTMENTS,
Washington, September 28, 1908.

Hon. ROLLA WELLS,
Mayor of the City of St. Louis, Mo.

SIR: The commission appointed by the Postmaster-General to investigate and report to him with reference to the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube mail service and operating the same, etc., appointed a subcommittee, consisting of Messrs. Stewart, Bradley, Masten, and Norris, to take up the investigation and details of the inquiry as provided by law. Accordingly, we have the honor to submit the following:

The Postmaster-General has contracted with the St. Louis Pneumatic Tube Company, a corporation organized under the laws of the State of Missouri, for the installation of pneumatic tubes and necessary power plants and operating machinery and the operation of pneumatic-tube mail service as contractor with the United States in the city of St. Louis, for the period commencing July 1, 1907, and ending June 30, 1916. The contracting company has been requested to furnish you at once a map showing the lines contracted for, those in operation separate from those under consideration.

In the act of March 27, 1908, making appropriations for the service of the Post-Office Department for the fiscal year ending June 30, 1909, Congress provided as follows:

"And the Postmaster-General is hereby authorized and directed to investigate and report to Congress not later than January 1, 1909, the feasibility and desirability of the Government purchasing or installing the equipment for pneumatic-tube service, and thereafter operating the same in the cities where such service is now in operation, and also ascertain and report the approximate cost of purchase and likewise of installation and the cost of maintenance and operation."

One of the important questions for consideration of the commission, and ultimately the Postmaster-General and Congress, is the relations which exist between the United States and the municipality of St. Louis and the attitude of the latter toward the former in the matter of the performance of mail service by pneumatic tubes through the streets and municipalities, in the event the United States should purchase the tubes now laid or install others for the direct performance of mail service thereby.

We therefore have the honor to request that we be furnished with a copy of existing laws and ordinances relative to the granting of franchises in St. Louis and such other matters of regulation as may exist relative to the installation and operation of such property in the streets. We also have to request to be informed as to your opinion regarding the application of the local ordinances respecting the franchises, etc., to the United States in the matter of the installation of pneumatic tubes and the operation of mail service through the same. In this connection we beg leave to submit for consideration our understanding with respect to the general rights of the United States in the conduct of the mail service. These general propositions may be stated as follows:

That the Constitution of the United States confers upon Congress the power "to establish post-offices and post-roads." (Constitution, Art. I, sec. 8.)

That this power granted to Congress carries with it all powers necessary to make it effective.

That all the streets of a city like St. Louis over which letter-carrier routes are established are post routes under the law.

That the conduct of the postal business by the Post-Office Department is a governmental function.

That any statute or ordinance which imposes any restriction on the free exercise of this function other than to make the agents of the Government subject to the local police regulations or the police power of the State will have no effect as against the United States.

As our report to the Postmaster-General must be made at an early day, I have the honor to request as early a reply as practicable.

Very respectfully,

JOSEPH STEWART,
Chairman Subcommittee Pneumatic Tube Commission.

MAYOR'S OFFICE,
St. Louis, October 7, 1908.

Mr. JOSEPH STEWART,
Chairman Subcommittee Pneumatic Tube Commission,
Post-Office Department, Washington, D. C.

DEAR SIR: In further response to your communication under date of September 28, 1908, I transmit herewith copy of an opinion of date of October 6, 1908, of the honorable city counselor of the city of St. Louis, relative to the matter in question.

I also inclose copy of ordinance No. 21143, approved June 10, 1903, authorizing the St. Louis Pneumatic Tube Company to lay and maintain pneumatic tubes, with necessary appurtenances, to be used for the purpose of transmitting the United States mail in and under certain streets in the city of St. Louis.

Very truly,

ROLLA WELLS, *Mayor.*

LAW DEPARTMENT,
St. Louis, October 6, 1908.

Hon. ROLLA WELLS,
Mayor, St. Louis.

DEAR SIR: I have the honor to acknowledge receipt of your communication of September 30, inclosing a letter to you under date of September 28 from the chairman of subcommittee of pneumatic tube commission of the United States Postal Department.

You ask that I inform you what rights the National Government has in the matter of constructing pneumatic tubes in our streets for the transmission of mail, and what steps will be necessary for the United States Government to construct and operate such tubes for such purpose.

The letter from the United States Postal Department states that that department considers that it has the authority to tear up the streets of this city and construct pneumatic tubes therein for the purpose of transmitting mail without any authority from the city, being subject only to what is stated in said letter to be local police regulations, and the Constitution of the United States, Article I, section 8, which empowers Congress to establish post-offices and post-roads, and the acts of Congress declaring all highways in the United States post-roads, are cited as authority.

Of course as I understand the situation it is desirable, from both the standpoint of the postal service of the United States Government and of the business and social conveniences of the city of St. Louis, that mail be distributed through our streets by pneumatic tubes rather than some slower and more cumbersome method which more or less obstructs traffic on the streets, and therefore I presume the city is desirous of cooperating with the National Government in any way that does not unduly hamper local business in the matter of the transmission of mail.

I take it to be well settled that the United States Government owns no title to the soil or any easement therein of any land in any State other than the public lands belonging to the United States, and that the highways located within the respective States do not belong to the United States, and that the United States has no easement therein, nor owns any interest in the same.

So far as I have ever been able to ascertain it never has been judicially determined exactly what is meant by the clause in the Constitution of the United States empowering Congress to establish post-offices and post-roads. The power to establish post-offices occurs in the same clause of the same sentence of the same section of the same article of the Constitution which empowere Congress to establish post-roads.

That the National Government has the power to adopt any lawful means it sees fit to accomplish the purpose designated in the Constitution is not a subject of controversy.

Neither is it a subject of controversy that the United States Government has no lawful authority to take property without compensation that does not belong to it.

The fee to the soil of the highways in the State of Missouri is owned, generally speaking, by the owners of the abutting property and not by either the State, or the political subdivision of the State in which the highway may be situated, or by the United States.

The power to regulate the use of the highways located in the various States inheres in the respective States, and such States may, under our system of government, delegate, for the time being, this police power to cities in the respective States so far as regards the highways located within such cities, respectively.

The primary use of highways is travel thereon, and all may, subject to the reasonable regulations of the respective States or cities, travel on the highways.

None of the traveling public, whether they be private citizens or officials of the city, State, or nation, have any right to any exclusive possession of any part of any highway, except under proper grant or permission of the State or city, as the case may be.

Paragraph 2 of Article III of section 26 of the charter of the city of St. Louis, which was enacted under constitutional power granted the city of St. Louis, vests in the city of St. Louis the right to regulate the use of the highways located within such city.

There is no provision of law of the State of Missouri, nor of the city of St. Louis, nor of the United States, even though the United States had the power to enact such law, authorizing the United States Government to exclusively occupy any portion of any of the streets or highways located within the city of St. Louis.

The United States Government, through its officers, agents, licensees, and contractors, has the same right to use the highways located within the city of St. Louis that other members of the public have, but no more right. This right, as before stated, is the right to travel and the incidents thereto.

The United States Government, in my judgment, has no right to enter upon any highway of the city of St. Louis and excavate the same or locate therein any permanent structure without the consent of the city of St. Louis.

I have been able to find no authority of any court which tends in any way to declare that the United States Government has any other right than above indicated in the use of the highways of any State or city.

The acts of Congress which declare all highways located within all the States post-roads do not and, in my judgment, could not lawfully appropriate for the exclusive use of the United States Government, without compensation or authority from the proper State or city, any portion of any highway without the consent of the local authorities, State or city, as the case may be.

The only postal road that I know of which the United States Government undertook to establish was the road known as the Cumberland Gap Road, extending through parts of the States of Virginia, Maryland, Pennsylvania, and Ohio. Before constructing this road the United States Government acquired the consent of the respective States.

It is, it seems to me, perfectly apparent that the United States Government would have no authority to establish a post-office in a highway of the State, or in any public or private property located within the State, without acquiring the right to do so under the laws of such State. The same rule applies to post-roads, if by establishing post-roads is meant more than using the highways as the public have a right to use highways, namely, for travel. Further than this, it may not be inapt to remember that the streets of the city of St. Louis may be vacated by the city, and according to the law of this State, in the absence of contracts to the contrary, upon the vacation of a highway, the public easement being wiped out, the adjoining property owner owns the fee to the soil freed from the public easement, and of course would own whatever remains upon or in such soil in the absence of some arrangement to the contrary.

If the United States has the right, without the consent of the State, to appropriate to its exclusive use portions of the highways for pneumatic mail tube purposes, these mail tubes, upon the vacation of the highway, would, as a part of the soil, become the property of the adjoining owner, unless, indeed, the United States Government under the constitutional provision and acts of Congress above mentioned has the right to retain that ownership and use of this private property, because the same is private property after the public easement of the highway is abolished; and if the United States Government can by action of its administrative officers, or by such action in conjunction with the legislative act, so appropriate private property for public use without compensation, what becomes of the constitutional provision contained in amendment 5 to the Constitution of the United States?

I find no authorities which bear directly upon the main question involved in this opinion, but cite hereto several which bear somewhat upon it. (Searight *v.* Stokes, 3 How., (U. S.), 151; St. Louis *v.* Western Union Telegraph Co.,

149 U. S., 469; Western Union Telegraph Co. *v.* Pennsylvania Railroad Co., 195 U. S., 540, 557; Sluder *v.* Transit Co., 189 Mo., 107.)

In my opinion it is necessary, before the pneumatic tubes can be constructed or used lawfully in the streets of the city of St. Louis, that an ordinance of the municipal assembly authorize the same.

Of course, the National Government has the power of eminent domain, but whether it can exercise the same so as to take public property of the State or city is a question which, I take it, is not involved in the present inquiry.

You ask for copies of such ordinances as relate to pneumatic tubes. There is only one that I could find, and that is an ordinance approved June 10, 1903, being No. 21143, whereby certain franchises or rights in the streets were granted to the St. Louis Pneumatic Tube Company, being the same company which, according to the letter from the Post-Office Department, said Department has contracted with.

I inclose said ordinance, and I herewith return the letter from the Post-Office Department above referred to.

Respectfully, CHAS. W. BATES, *City Counselor.*

ORDINANCE No. 21143.

AN ORDINANCE To authorize the St. Louis Pneumatic Tube Company to lay and maintain pneumatic tubes, with necessary appurtenances, to be used for the purpose of transmitting the United States mail in and under certain streets in the city of St. Louis.

Be it ordained by the municipal assembly of the city of St. Louis, as follows:

SECTION 1. The St. Louis Pneumatic Tube Company is hereby granted the power and is authorized to lay and maintain pneumatic tubes, with the necessary manholes and switches, to be used for the purpose of transmitting the United States mail under contract made with the United States, in and under the following named streets of St. Louis: Locust street from Ninth street to Third street; Third street from Locust street to Olive street; Olive street from Second street to Third street; Ninth street from Washington avenue to Pine street; Pine street from Ninth street to Twentieth street; Nineteenth street from Pine street to Olive street; Nineteenth street from Pine street to Market street; Twentieth street from Pine street to Clark avenue; Washington avenue from Ninth street to Third street.

The pneumatic tubes herein authorized shall be used exclusively for the transmission of United States mail. The said work shall be begun within ninety days of the approval of this ordinance, and shall be completed within twelve months thereafter.

A discontinuance or abandonment of the use of said pneumatic tubes for the transmission of mail by the United States Government for a period of one year shall cause a forfeiture of all the rights, privileges, and franchises herein granted.

SEC. 2. The St. Louis Pneumatic Tube Company, in performing said work and maintaining said tubes, shall comply in all respects with the requirements of the revised ordinances of the city of St. Louis, and all amendments thereof, and its work shall be subject to the supervision and control of the board of public improvements.

The city of St. Louis shall, at all times, through the board of public improvements, have the right to inspect, superintend, and control the construction of the tubes and other appurtenances constructed under this ordinance, and the city reserves the right from time to time to order any changes to be made, either in the construction, material, or manner of maintaining same or in the location in the street. All such changes or alterations shall be made by the St. Louis Pneumatic Tube Company without expense to the city, and if the said company fails to comply with any ordinance directing such changes, within such time as may be specified therein, then said board may cause such alterations to be made by the city, and the company owning the pipes or other appurtenances so changed or altered shall pay the costs thereof on demand by the city comptroller.

Failure to make such payment when so demanded shall constitute a breach of the bond, as provided for in the next succeeding section.

SEC. 3. This ordinance shall not take effect unless within ninety days from the date of its approval the company shall file with the city register its written acceptance of the terms and conditions of this ordinance and its agreement to be bound thereby, and file the penal bond of said company in such form as

shall be approved by the city counselor in the sum of fifty thousand dollars, with two or more good and sufficient sureties, to be approved by the mayor and council, conditioned that the said company will observe and comply with all the terms and conditions of this ordinance, and conditioned that said company shall hold the city of St. Louis harmless from all damages arising from the construction or maintenance of said pneumatic tubes.

And if at any time said bond shall be impaired by recovery thereon in any court of competent jurisdiction, or by reason of the death or insolvency of any of the sureties thereon, then, and in such event, said St. Louis Pneumatic Tube Company shall renew said bond so that at all times the sum thereof shall be fifty thousand dollars, with surety as aforesaid, and all renewals of said bond shall be made within twenty days after notice in writing by the mayor.

Any failure to comply with the provisions of this section by said St. Louis Pneumatic Tube Company shall work a forfeiture of all rights and privileges herein granted.

SEC. 4. In consideration of the privileges granted in this ordinance, the said St. Louis Pneumatic Tube Company, for itself, its successors, and assigns, agrees to and binds itself to make on the first Monday in January, nineteen hundred and four, and also on the same day in each year thereafter during the duration of this franchise, which shall be twenty-five years, an annual statement of its gross earnings. Said statement to be sworn to by its president and secretary and also, upon the said designated days, pay into the city treasury, for the sole use and benefit of the said city of St. Louis, a sum of money equal to five per cent on the said gross receipts.

The comptroller of the city of St. Louis shall have the right at his discretion to inspect the books of said company, so far as the same bear on the amount of its gross receipts.

Approved June 10, 1903.

Informal conference at New York September 17, 1908, between Post-Office Department subcommittee on pneumatic-tube service and gentlemen representing the American Pneumatic Service Company of New York City.

Present: For Post-Office Department, Messrs. Stewart, Bradley, Masten, and Norris; for American Pneumatic Service Company, Judge Goodrich, Messrs. O. and W. H. Ames, S. L. Whipple.

Statement of Mr. Whipple.

Mr. WHIPPLE. All that we now have to present with the limited knowledge we have of what the committee would desire is a statement of the cost of various systems which are controlled by the American Company as appear by our books, and certified to by public accountants who made examination of our books for that purpose. You will understand that almost all this expenditure was made by administrations of the Company which preceded that which is now in management, and therefore the officers for whom I speak have to depend, and do depend very largely, upon the books of the corporation for the facts, and the report of Messrs. Niles & Niles, who are public accountants here in New York City, and gentlemen of very high standing and reputation.

The actual capital stock and liability to March 31, 1908, as represented in stock, bonds, and notes as certified to by Messrs. Niles & Niles are as follows:

The business in Boston belongs to the Boston Pneumatic Transit Company. That is a corporation organized with a capital of $50,000 (?). There are 6.89 miles of double tube of the Boston Company. That has cost $510,076.77. I ought to say in that connection that a part of this cost to the extent of approximately $55,000 is the result of an excess of operating expenses over income, as stands on our books, because the operating expenses exceeded the income for a certain period some years back, and I presume at a time when the system could not be operated because there was no appropriation of Congress. So, if that were not considered legitimate cost as we carry it on our books, it would be taken from the $510,076.77. (Given period when the operating expenses exceeded the income so as to account for the $55,000 to be ascertained later.)

The cost of the Chicago Postal Pneumatic Tube Company (which is the company which operates in Chicago, and has in operation and laid 9.18 miles of double tube) is $1,036,154.64. That includes the capital stock of the company ($100,000) which was issued and given to the American Company in return for a right granted by the American Company to use all of its patents in the building and extension of the system in Chicago. You will notice that there is noth-

ing of that sort in respect to the Boston Company, to which I have referred, and that is why I call particular attention to this, because the Chicago Company has a distinct and definite right to use the patents of the parent company either in the State of Illinois or city of Chicago, certainly for all of its purposes of operation; and that right was appraised at $100,000. So that the capitalization of the Chicago company includes that right. (Capitalized arbitrarily by the officers of the company.)

(Mr. Masten inquired for what term of years.)

Mr. WHIPPLE. I think an indefinite term.

(Mr. Masten also questioned the miles in operation, stating that they should be 8.70 rather than 9.18.)

Mr. WHIPPLE. The question of the number of miles in Chicago does not affect the above statement. Whatever we have there has cost, and stands the company in, in the way I have indicated, and the amount indicated, although apparently it is less than we thought.

The St. Louis company is a Missouri corporation called the Missouri Pneumatic Tube Company, and the cost in the way I have indicated of the system as there installed is $391,152.71. There also the capital stock (which is $50,000) was given to the American Company in consideration of the use of the patent rights of the parent company for that system; so we have there an arbitrary estimate of the supposed value of the patent rights for that limited area. It is true that the system contracted for at a price which aggregates the figures I have indicated is not finished, and that figure includes the obligation on the part of the American Company to complete it, and by rough estimate I think it is believed that it would cost $120,000 to complete it. If, therefore, that contract was out of the way, and you estimate the value of what is already constructed, you would need to deduct from the $391,152.71 approximately $120,000 to get the actual cost of what has been constructed. I stated it the other way because, you see, that is the way it appears on our books, because there is the obligation on the part of the American Company to complete this contract, the American Company being the contractor. The mileage is 2.09.

The service in the city of New York comes under the head of the New York Pneumatic Service Company and the New York Mail and Newspaper Transportation Company. Both have a mileage in New York according to our figures of 21.7284. The American Company acquired the securities, stock, and bonds of the New York Mail and Newspaper Transportation Company. It owns a controlling interest in that corporation. There is some comparatively small minority of stock outstanding. The New York Pneumatic Service Company (as I remember it) was a corporation organized to take over the Tubular Dispatch Company, which failed and went into the hands of a receiver, and was acquired from the receiver, and its assets became the assets of the New York Pneumatic Service Company.

The cost to the American Company of the New York Pneumatic Service Company, and the assets which it has of the old Tubular Dispatch Company, and the securities which it holds in the New York Mail and Newspaper Transportation Company, is $2,734,139. We have no figures so far as I know showing actual cost of the different items of construction, because the construction was made by the other companies, which were independent, and I think perhaps competitive companies of our own at the time they constructed, but I think our company had a feeling that it got a bargain sale of the Tubular Dispatch assets from the hands of the receiver, and that the difficulties of the company, because they could not get adequate compensation from the Government for the service they were performing, enabled the American Company to acquire its assets at certainly no higher figure than what the cost had been to secure the franchises and establish and equip the plant. I think it was felt there were some privileges in the franchise of the New York Mail and Newspaper Transportation Company that were perhaps better than could be secured under the new theories and ideas that grant privileges to quasi-public corporations.

If you care to take the separate items, and they will be of interest, they are as follows: The New York Mail and Newspaper Transportation Company has cost $2,097,754.96, and the New York Pneumatic Service Company $636,384.04, making the aggregate which I have already given, $2,734,139.

You will observe that I have given cost up to March 31, 1908. Since that time we have spent in construction in New York approximately $50,000. We shall spend, and are required to spend to finish the New York system as far as Station L, $50,000 more. We shall then have the amount of mileage which I indicated. I put it in that way because I am totalizing the cost when the New

York system so far as Station L shall have been completed, which will be at a cost of $50,000; just as I also give the systems which we hope to complete in St. Louis, and indicated to you the amount that it would cost to complete it. So, to get absolutely correct cost of construction the deductions I have indicated will be made from the grand total.

The total of the figures which I have given in items, as we compute it, is $4,771,523.12. As you will observe (as we have followed along in the St. Louis Company and in the Chicago Company), the capitalization of those companies represents the cost to them (by an arbitrary figure fixed by the officers of the companies) of the value of the use of all the patents of the American Company, amounting to $150,000. In the New York Pneumatic Service Company and the New York Mail and Newspaper Transportation Company, and in the case of the Boston Company as I understand it, the cost does not include any such items, so that if it ever should seem wise to the Government to acquire the properties of the American Company used in the mail service, I take it that what they would acquire would be the capital stock, bonds, and liabilities of each of the separate companies, and either a perpetual and exclusive license for mail purposes under the patents of the American Company throughout the United States or wherever they wish to use them, and all patents that were applicable to pneumatic-mail service, or what the corporation which we represent would have to dispose of to the company would be the items which have cost as indicated here, and the patents or exclusive licenses under the patents. Of course, if they acquired the patents and paid full value for them, why the figures which I have stated represent $150,000 of value already. I mean that would be duplicated if you gave full value of patents without licenses granted.

Putting it the other way—if you acquire what we have at the full value, including $150,000 for licenses under the patents, you would deduct that amount from the fair valuation of the patents.

The Tubular Dispatch Company had no right to patents of the American Company. What I mean to say is they had no rights under the patents owned by the American Company at the time, but they had patents of their own, and the American Company acquired in its purchase the control of the patents both of the Tubular Company and of the New York Mail and News Transfer Company, which are some of the most important patents because they were the Batcheller patents.

Our claim is now that, having acquired the patents of the Tubular Dispatch Company and the Mail and Newspaper Transfer Company, combined with the patents of the American Company, which it already has, that the company has, and can maintain up to date, a complete monopoly of the pneumatic tube service on any practical lines of construction. You are quite right in the suggestion that we did acquire additional patents when we purchased and paid this large amount for the two New York companies, but I had in mind when I spoke of having patents for sale, not those, because those were included in the purchase, and if we should be willing to sell out our good bargain at what it cost us, you would not get our patents on which the American Company was founded. So that it would represent the acquirement (I mean the amount we paid out for the New York companies) of very important patents, because they protect the basic patents of the American Company.

Mr. STEWART. You can give us, of course, a schedule of all those patents which you purchased of the other companies?

Answer. Yes. (Memorandum was made that the company furnish a list of their patents, making them in two classes; what the American Company held before it acquired these other companies, and what patents it acquired through the other companies.)

Mr. MASTEN. How much more of the patents owned by the American Company would it be necessary to purchase in addition to the rights held by each of the subordinate companies?

Answer. The old Batcheller patents of the subordinate companies are confined to those particular localities.

Mr. BRADLEY. Does the Philadelphia Company control any licenses from you, or patent rights for the State of Pennsylvania, or merely for Philadelphia?

Answer. Only Philadelphia, and I believe it runs into Camden and West Virginia, and those rights are complete.

Mr. STEWART. I would like to ask how these sums are represented on your books; for instance, we have Boston $510,000, representing cost of the Boston tubes.

Answer. That represents in part the capital stock of the company. The rest of it is in the shape of promissory notes held by the parent company for its ad-

vances to the smaller company. You see, none of those companies are capitalized; they have a nominal capitalization, and the parent company has preferred to be a very large creditor and a small stockholder, rather than a large stockholder and a small creditor, and inasmuch as they own and control all of the stock it is really a question of convenience.

Mr. BRADLEY. Are the detailed figures of cost subject to analysis?

Answer. I have not them here.

Statement of Judge Goodrich in regard to franchises and taxes.

In connection with the franchise in Chicago I investigated the question as to the right of the city to charge in the franchise a tax on the gross receipts of the company for the use of the streets for the tubes. The franchise granted by the city provided that the tubes could only be used for carrying government mail, and no other purpose; and it also provided that for the first four years it pay 3 per cent on gross receipts, and balance of the time 5 per cent. I investigated that question, and could not find in any place where it ever showed the Government's right to go under the streets,

The officers of the company are to prepare a comparison of the actual cost of construction and operation at present and previously (reference was made to the Pneumatic Tube Report of the Postmaster-General, 1900, pages 72 and 78).

PNEUMATIC TUBE COMMISSION SUBCOMMITTEE,
New York, N. Y., October 16, 1908.

Present: Superintendent V. J. Bradley, Assistant Superintendent J. M. Masten, Assistant Superintendent E. M. Norris.

Witness: Mr. B. C. Batcheller, chief engineer American Pneumatic Service Company.

Mr. BRADLEY. What is the present interval allowed between carriers in pneumatic tubes?

Answer. I understand that the manager of operation of the tube company has established an interval of thirteen seconds for ordinary cases. There may be some exceptions to this.

Mr. BRADLEY. What would be the theory in regard to proper intervals, and what is your own experience and opinion?

Answer. This answer depends upon a number of factors. First, the construction of the receiving apparatus, which is of two types known as the open receiver and the closed receiver, the second requiring a greater interval of time to operate, perhaps three seconds as compared with one second. The velocity of the carrier with reference to the velocity of the air, and with reference to other carriers, depends upon the size of the packing rings, which are constantly changing, due to wear and due to weight of load carried, and the amount of service that they render; and this wear of the carrier rings affects the interval between the carriers as they travel through the tubes, the interval varying more as the carriers become worn and smaller. Owing to this variation in speed of carriers it is necessary to establish a minimum time interval of dispatch, and also on account of the variation in load contained in the carrier it is necessary to have a proper interval.

Mr. BRADLEY. In view of these factors as explained, has your experience enabled you to establish a formula, and what is the formula?

Answer. In reply to that question I would say that we have not established a formula, and I do not think it is possible to establish a formula. I think that a safe and economical minimum time interval can only be established by experience.

Mr. BRADLEY. Assuming that the same conditions exist as regards receivers, what would be a safe reduction in time interval as between a line having an air circuit of 4 miles and another line having an air circuit of 1 mile if it be assumed that in the former instance a thirteen-second interval would be safe?

Answer. I should say that the time interval might be reduced two or three seconds.

Mr. NORRIS. Could any additional economy be exercised in regard to space occupied in postal stations as to power plants?

Answer. In reply I would say that, if a system were constructed similar to the one in Philadelphia, where a power plant is required at every station, blowers directly connected to electric motors could be used which would occupy less space than air compressors. A station having double terminals, in which three blowers would be required, the blowers, motors, switchboards, and lockers for such station could be placed in a space of 700 to 1,000 square feet.

The use of blowers in place of air compressors is a recent experience. Such a system as used in Philadelphia requires a somewhat greater outlay in rental for space for power plants, but the advantage of this system is that it gives greater carrying capacity and greater freedom from interruptions in the service. The cost of constructing such system is somewhat greater, owing to the greater number of blowers and motors that are required. The cost of operation is probably no greater.

Mr. BRADLEY. As I understand it, the circular open-table receivers are in use only in Philadelphia?

Answer. Yes.

Mr. MASTEN. What style of transmitter and receiver does your experience enable you to recommend?

Answer. I would recommend the gravity transmitter, and the circular open-table receiver wherever possible, with blowers at every station.

Mr. BRADLEY. What do you regard as the maximum economical speed in pneumatic-tube service?

Answer. I think that 30 miles per hour is the maximum economical speed. I think that on some of the lines equally efficient service can be rendered with a somewhat slower speed—say 25 miles. From the general post-office to Station L in Brooklyn, and from Armour station to stock yards in Chicago the lines connect outlying stations, and are not subject to congestion. The difference of a few seconds in the time of transit in the carriers does not materially affect the efficiency of the service.

Mr. BRADLEY. Do you think it is feasible with the existing plants to increase the length of the carriers from 24 to 30 inches; or could any increase be made?

Answer. I do not think this could be done without changing the apparatus and the length of the bends, necessitating rebuilding the entire system.

SUBCOMMITTEE OF PNEUMATIC TUBE COMMISSION,
Boston, Mass., October 23, 1908.

Present: Messrs. Bradley, Masten, and Norris; witness, M. L. Emerson, operating manager subsidiary companies performing pneumatic-tube service in Boston, New York, Brooklyn, Chicago, and St. Louis.

Q. Have you any formula for establishing a safe headway between successive carriers in pneumatic tubes?—A. No.

Q. How do you, then, determine the safe headway between successive carriers?—A. By observation and by experience in the operating of the systems.

Q. Is the headway dependent on the length of the line?—A. Yes.

Q. What factors are of value in determining a safe headway between successive carriers?—A. First, the length of the line; second, the physical condition of the line—by this I mean the number of bends, etc., in the line, the manner in which the line was laid, and the degree of moisture in the line; third, the type of terminal receiver used; fourth, the condition of the carriers as indicated by the wear and tear on the outside surface of its packing rings.

Q. To what extent does the length of the line affect the interval between successive carriers?—A. On the longest lines which are now in operation it might affect the interval as much as five seconds.

Q. To what extent do you think that the condition of the line would affect the interval?—A. The condition of the line might affect the interval as much as five seconds.

Q. To what extent would the type of receiver used affect the headway?—A. The carriers can be sent fastest with a receiver which has no gate; can be sent almost as fast with a so-called open receiver which has one gate only, and must be sent considerably slower with a receiver which has two gates by means of which the carrier is brought out of the line at a pressure above that of the atmosphere.

Q. What would be the extreme variation as between the most rapid and slowest of these receivers?—A. With a receiver which has no gate, the carriers can be sent at such intervals that they can be removed from the receiving table before colliding with each other in going into the pan. This would depend somewhat on the age of the carrier. With receivers containing one gate, the same answer as above applies, except that time must be allowed for the carriers to cushion, or, in other words, for the operation of the machine. For receivers of the two-gate type, the same answer as above applies, with the addition that as a rule this type of machine must be studied in its separate cases. In general, a receiver containing no gates could probably receive carriers on an

approximately six to seven second interval. This interval would depend on the rate at which the transmitter worked, on the age of the carrier, and on the ability of the employees to handle the carriers. A receiver containing one gate could not, in actual practice, be worked successfully at much less than ten seconds headway. A receiver containing two gates should not, I think, in actual practice, be worked much faster than thirteen seconds headway.

Q. To what extent may the outside diameter of the packing rings be reduced before good practice would require that the carrier be removed from service?—A. Approximately one-eighth inch in diameter.

Q. As between a perfect packing ring and one that had been reduced one-eighth inch in diameter, how would the variation in speed affect the headway?—A. From seven to eight seconds at maximum.

Q. Have you made a special study of this kind of work?—A. I have.

Q. Has this study, with your observation and experience, led you to increase the headway on certain lines?—A. Yes.

Q. Can you instance the line on which the headway was increased?—A. On the Chicago system.

Q. Anywhere else?—A. No.

Q. Has the headway been increased in St. Louis?—A. My impression is that it was decreased from fifteen seconds, although no definite interval was ever arrived at in that system to my knowledge.

Q. In cases where you have increased the headway, have you deemed it necessary to confer with the postal officials?—A. Yes, as a matter of courtesy.

Q. Have you understood that the contracts between the Post-Office Department and the pneumatic tube companies require a certain frequency which must be maintained?—A. No; but it has always been understood that the interval btween carriers should be as short as was consistent with the safe operation of the tube.

Q. About how many miles may a carrier travel before its removal is required for new packing rings?—A. Between five and nine thousand, depending on the systems where used and also apparently depending on the mixture of the material which is used in packing.

Q. What is the system of inspection for verifying the diameter on the outside of the packing rings?—A. The carriers are continued in operation until such time as they begin to give trouble in the receiving machines, due to their overtaking each other in the tubes.

MEETING OF SUBCOMMITTEE OF PNEUMATIC TUBE COMMISSION.

BOSTON, MASS., *October 22, 1908.*

Present: Messrs. Bradley, Masten, and Norris. Witness: Mr. Luke D. Mullen, firm of Coleman Brothers, 15 Court square, Boston.

Mr. Bradley read the law and explained that there was no appropriation made by Congress so that reimbursement could be given to experts and witnesses for their testimony before the commission.

Q. Will you state, Mr. Mullen, the experience that you have had in general contract work?—A. I have had seventeen years' experience in all kinds of work—sewer pipe, construction of reservoirs and dams, the building of subway on Washington street, and part of the East Boston Tunnel, etc.

Mr. Masten then explained the route followed by the two pneumatic tubes which are now in operation in Boston.

Q. Mr. Mullen, do you think it would be advantageous to give out the work of construction piecemeal or to have one contractor who would look after the excavation, the laying of pipe, repaving, etc.?—A. In my opinion, it is best for one man to do the whole work.

Q. What is the practice in regard to giving bonds in contract work? Is the bond obtained from the Surety Company?—A. Always.

Q. What is the usual amount of the bond in municipal work?—A. In municipal work it runs all the way from one-fifth to one-third, according to the size of the contract.

Q. What is the usual premium of bonds?—A. About 5 per cent of the amount of the job.

Q. What is the usual premium paid for insurance?—A. It depends entirely on the classification of the work. On this class of work, from 1½ per cent of the amount of the pay roll to 3 per cent. In tunnel and subway work it runs to 9 per cent of the amount of the pay roll, and in one instance that I had recently it amounted to 12 per cent.

BOSTON, MASS., *October 22, 1908.*

PNEUMATIC TUBE COMMISSION.

GENTLEMEN: I inclose you the following list, as requested by you, for an approximate estimate for laying the 8-inch pipe:

	Cents per lineal foot.
Excavation from	24 to 33
Laying	10
Lead, jute, and blocking	10
Teaming pipe	5
Time keeping and foreman	5
Bond, insurance, and incidentals	.2
Testing	2
	67
Profit (15 per cent)	10
	77

In the work of laying the pipes through the city you will encounter many of the underground conduits of the different public-service corporations, which, by the different types, can easily be figured at the ordinary rates for replacing the same if disturbed by your pipes.

Contract prices for brick work at present range from $12 to $15 per cubic yard, and duct laying is the same as in all parts of the country.

The paving, as explained to you before, ranges from $5 to 65 cents per square yard, which can be apportioned by the area that the excavation would cover.

Respectfully, yours,

LUKE D. MULLEN.

Mr. FRANKLIN A. SNOW, room 303, John Hancock Building, Boston, Mass.

Q. Will you kindly state what experience you have had in this general class of business which enables you to speak with authority?—A. I laid the first pneumatic tube line that was ever laid here from the general office to the North Station. Since then I have done all their street work and repairs, built the main line, in fact, I guess I have done all their work for a period of ten or eleven years. I did all of the underground work of the Edison electric people; I laid all the conduits for the Massachusetts Telephone and Telegraph Company; I have been laying and building reservoirs for the last twenty years.

Q. I presume the company furnishes the pipe?—A. They furnish the pipe, deliver it along the line of the work, clean and scrub it, and furnish all the labor and also install the lines.

Q. Could you indicate to us in an approximate way the cost of constructing the line proper, divided up in items of excavation, laying the pipe, etc.?—A. I take pleasure in handing you a statement which shows the length of lines in different localities and the cost per trench foot of construction. This statement includes everything, except the cost of the pipe test. It also includes manholes in different parts of the city. The total is for about 32,000 feet trench work, the trench accommodating double-line pipe.

(Mr. Snow adds that the statement, as submitted, includes the cost of municipal inspection and supervision, but does not include the cost of any supervision or engineering work on the part of the principal. It does not include the making of any maps, or the cost of construction, or the furnishing of all lead, in fact, only the furnishing of the pipe on board cars.)

Q. Are you familiar with the price of pipe?—A. Well, no; I can not say that I am very familiar. Ordinary water pipe costs $25 or $26 per ton.

Q. Do you know the price of pipe such as is used in the pneumatic-tube service—eight-inch pipe?—A. About $30 per ton, exclusive of boring and machining.

Q. Do you know anything as to the cost of boring and machining of pipe?—A. No; nothing at all.

Q. Mr. Snow, what is the practice in Boston in giving out contracts? Is it for a fixed price or for a percentage of the total cost?—A. Well, all that I know is of straight contract work for a fixed price. All repair of the Pneumatic Transit Company is based on the percentage plan—cost of material and labor—because the extent of the work can not be estimated in advance.

Q. What is the usual percentage allowed to the contractor?—A. Fifteen per cent is general.

Q. In this contract work which you have done, is it customary to give bond?—A. Oh, yes; always.

Q. To what amount?—A. Well, I think about one-third of the estimated cost, according to the contractor's figures.

Q. Is that bond obtained very easily?—A. Yes.

Q. What is the usual premium?—A. One per cent.

Q. One per cent of the amount of the bond, or 1 per cent of the amount of the contract?—A. No; the amount of the bond.

Q. Is it customary to include in contracts the requirements for insurance against claims of injuries to employees and the general public?—A. Yes, it is customary; always customary.

Q. What is the usual premium paid for such insurance?—A. About $5\frac{7}{10}$ per cent of the amount of the pay roll. It would be for this class of work.

Q. Is it supposed that there is any special risk in this class of work?—A. No; it is not considered as risky as sewer work. Any sewer work is $6\frac{7}{10}$ per cent.

Q. Mr. Snow, have you found much rock in your excavations for pneumatic-tube work?—A. Very little. Only in Roxbury. It is mentioned in my statement just delivered to you.

Q. Do you know whether it would be feasible to lay pneumatic tubes in the tunnels or subways in Boston?—A. I find it would be difficult; that the location can not be found and the transit company would be very averse to grant such a location.

Q. Did you lay the conduits for carrying their own rails?—A. Yes; in the Tremont subway, and they were placed in the lower corners outside of the rails.

Q. Would there be an opportunity in any part of the day between trains to do much work for laying the pipes or making repairs?—A. No; but probably from midnight to 4 or 5 o'clock in the morning.

Q. Is there any space above in the arches of the subway or in the braces supporting the roofing to lay the pipe in?—A. No; there is no place. It is all concrete construction.

Q. Has the tunnel under the Charles River more space than the Tremont?—A. Well, I really can not answer that question. I should not imagine that they could. The conduits are laid in the bottom and in the center of these tunnels and take up all the space.

Q. Are there any municipal pipe galleries or subways for gas and water pipes in which the government pneumatic tubes might secure joint occupancy?—A. There are no such galleries or subways in the city of Boston at the present time.

Statement submitted by Mr. Franklin A. Snow, October 22, 1908, as showing the actual cost of street work in connection with the Boston Pneumatic Tube Service.

Street.	Paving.	Area.	Cost.	Total.
		Sq. yds.		
Causeway street post-office to Staniford street	P. & P. concrete	320	$4.38	$1,401.60
Staniford street	Ordinary block	1,080	3.00	3,240.00
Temple street	Macadam	640	3.00	1,920.00
Derne street, Temple to Bowdoin	do	180	3.00	540.00
Bowdoin street, Derne to Beacon	200 bitulithic 440 brick	580	6.00	3,480.00
Beacon street, Bowdoin to Tremont	Ordinary block	640	3.00	1,920.00
School street	P. & P. concrete Wooden block	600	5.00	3,000.00
Washington street, School to Spring lane	Concrete	70	6.00	420.00
Spring lane	Block	240	7.00	1,680.00
Summer street, across Church Green	P. & P. concrete	200	4.40	880.00
Lincoln street, Summer to Beach	Grout concrete	940	5.00	4,700.00
Essex street, Lincoln to Chauncy	P. & P. concrete	920	4.40	4,048.00
Beach street, Lincoln to Atlantic avenue	do	580	4.50	2,610.00
Atlantic avenue, Beach street to "station"	do	200	4.50	900.00
Harrison avenue, Essex street to East Dedham	Ordinary block	4,900	3.00	14,700.00
East Dedham, Harrison avenue to Washington	Macadam	500	3.00	1,500.00
Washington street, East Dedham to Massachusetts avenue.	Ordinary block	2,100	3.00	6,300.00
Massachusetts avenue, Washington street to Harrison avenue.	Macadam	700	3.00	2,100.00
Harrison avenue, Massachusetts avenue to Dudley	2,600 ordinary 500 asphalt	3,100	3.00 6.00	7,800.00 3,000.00
Dudley street, Warren street to Columbia road	Ordinary block	7,000	3.00	21,000.00
Do	Rock			6,000.00

Statement submitted by Mr. Franklin A. Snow, October 22, 1908, etc.—Cont'd.

Street.	Paving.	Area.	Cost.	Total.
		Sq. yds.		
Warren street, Zeigler street to post-office	Ordinary block	150	$3.00	$450.00
Zeigler street, Harrison avenue to Warren street	Macadam	200	3.00	600.00
Kneeland and Eliot streets, Harrison avenue to Park square.	P. & P. new concrete	1,880	5.00	9,400.00
Providence street, Park square to Berkeley street	Ordinary block	1,350	3.00	4,050.00
Berkeley street, Providence street to St. James avenue.	Asphalt	150	6.00	900.00
St. James avenue, Berkeley to Clarendon street	Macadam	600	3.00	1,800.00
Clarendon street, St. James avenue to Boylston street post-office.	do Asphalt	560	5.00	2,800.00
Devonshire street, Water to Franklin street	do	740	6.00	4,440.00
Devonshire street, Franklin to Sumner	P. & P. concrete	680	5.00	3,400.00
Park square	Concrete Modern block	200	5.00	1,000.00
25 manholes			3.00	7,500.00
				129,479.60

ARTHUR S. TEMPLE, president United Store Service and Tube Company.
E. A. FORDYCE, chief engineer, same company.

This subcommittee, now in session, represent a committee appointed by the Postmaster-General to investigate the feasibility and desirability of the Government purchasing the installation or equipment for pneumatic-tube service, and thereafter operating the same in the cities where such a system is now in use, and also to ascertain the cost of maintenance and operation.

Q. There has been turned over your letter of July 1, 1908, addressed to the Second Assistant Postmaster-General, inquiring when the investigation of the pneumatic-tube service would begin. Do you desire, as representing the United Store and Tube Company, to make any formal statement to the subcommittee?—A. We appear before the committee to express our willingness to give you estimates of the cost and construction and of operation of the service in the cities where it is now in operation. While we have not prepared anything in a formal way, Mr. Fordyce is competent to quote offhand fairly approximate figures regarding the cost of construction in each of the cities.

Q. Mr. Fordyce, will you kindly state what experience you have had in this general class of business which enables you to speak with authority?—A. I started in the business in 1889 and have been connected with it since that time, barring a period of possibly a year. I was formerly connected with the Bosteda Package and Cash Carrier Company, Chicago; then the Bosteda Pneumatic Tube Company, the Lamson Consolidated Store Service Company, the American Pneumatic Service Company, and connected at present time with the United Store and Tube Company. I was in the employ of the Lamson Consolidated Store Service Company for a period of six years, from 1900 to 1906. While with the Lamson Consolidated Store Service Company I had charge of their pneumatic-tube department. I have designed and patented the construction of pneumatic tubes from 2 inches in diameter to 10 inches in diameter. I designed the 10-inch and built it in Chicago, and afterwards it was adopted in Boston and is used at the present time for carrying mail.

Q. Is your company in a position to make proposals to the Government for the construction of 8-inch pneumatic-tube equipment, including all necessary terminal machinery in its operation?—A. Oh, yes; at any time. This company has been established only since June, 1907, and since then the Government has issued no advertisements calling for bids for underground mail tubes.

Q. Does your company control independent patents that enable you to operate this system without regard to the American Pneumatic Service Company, or to the Batcheller Pneumatic Tube Company?—A. (Mr. Temple.) Yes, sir.

During the interview Mr. Fordyce, chief engineer for the United States Stores Company, quoted from his memorandum book of engineering data, cost of operating, etc., the following figures regarding the cost of operating pneumatic-tube mail service in Boston, Chicago, and St. Louis:

BOSTON.

For a period of two years and four months ending March 31, 1906:

Receipts from Post-Office Department for the period	$239,500.73
Operating expenses	178,035.00
Excess	61,465.00

Itemized as follows:

Cost of labor	54,734.00
Cost of power	42,147.00
Cost of repairs, including changes in lines and construction on account of subways	44,361.00
Taxes	5,520.00
Salaries	17,033.00
Miscellaneous, or not explained	14,240.00
	178,035.00

CHICAGO.

For the period from June 1, 1904, to March 31, 1906, one year and ten months:

Receipts from Post-Office Department for the period	$167,494
Operation, including labor, oil, and waste	45,007
Power	57,753
Repairs to tube line	6,311
Repairs to machinery	4,332
Repairs to carriers and new sets due to defective construction	26,620
	140,023
Excess, which does not include interest, profit, depreciation, and general expenses	27,471

ST. LOUIS.

For the period of two years and nine months to March 31, 1906:

Receipts from Post-Office Department for the period	$55,437
Operating expenses	15,944
Power	4,815
Repairs to tube line	138
Repairs to machinery	360
Carrier replacements	5,357
Taxes	1,385
	27,999
Excess, which does not include depreciation and interest on investments	27,438

On the following day (October 23) Mr. Fordyce handed to the committee the following estimates as to the cost of constructing the pneumatic-tube line in Boston, New York, Chicago, and St. Louis:

BOSTON.

Item.	Unit.	Price per unit.
Excavating and refilling	Linear foot trench	$1.36
Removing surplus earth	do	1.36
Cost of pipe and boring	Foot single pipe	1.41
Cost of specials	Foot single	5.00
Cost of laying complete	Foot double	.75
Freight and cartage	Foot single	.20
Paving, granite block	Foot trench	1.00
Supervision	Foot double (estimated)	.30

NEW YORK.

Item.	Unit.	Price per unit.
Excavating and back filling		$2.00
Removing surplus earth		.15
Cost of pipe	Linear foot, single	1.41
Cost of specials	do	5.00
Laying complete	Linear foot, double	.90
Freight and cartage	Linear foot, single	.20
Paving, asphalt	Linear foot	1.50
Paving, macadam	do	1.00
Paving, granite block	do	.80
Supervision		.40

CHICAGO.

Excavating and refilling trench	Linear foot trench	$1.40
Removing surplus earth	Linear foot trench (6 feet deep by 3½ feet wide).	.08
Cost of pipe and boring	Linear foot	1.41
Cost of specials	do	5.00
Cost of laying complete	Linear foot, double	.60
Freight and cartage	Linear foot, single	.40
Paving, asphalt	Linear foot trench	1.50
Paving, macadam	do	1.00
Paving, granite block	do	.80
Supervision	Linear foot, double (estimated)	.30

ST. LOUIS.

Excavating and back filling	Linear foot trench	$1.35
Removing surplus earth	do	.08
Cost of bored pipe (single)	Linear foot	1.41
Cost of specials (single)	do	5.00
Cost of laying (double)	do	.70
Freight and cartage	Linear foot, single	.40
Paving, granite block	Linear foot trench	.75
Supervision		.30

UNITED STATES POST-OFFICE,
Boston, Mass., October 22, 1908.

Mr. ARTHUR S. TEMPLE,
President United Store Service and Tube Company,
922 Tremont Building, Boston, Mass.

DEAR SIR: Your letter of July 1, 1908, to the Second Assistant Postmaster-General, inquiring regarding the investigation of the pneumatic-tube service in response to the recent act of Congress, was turned over to this subcommittee with other papers from the Post-Office Department, Washington, and led to the hearing of yourself and Mr. Fordyce at the subcommittee's session, Boston, to-day.

In the course of the hearing you announced that the United Store Service and Tube Company was not only willing but able to introduce pneumatic-tube service similar to the present system and equal to it in efficiency and that you would be able to submit forthwith an estimate of the cost of construction and operation.

It is requested, therefore, that you submit such statement, with as much detail as possible, for consideration by this committee, in conjunction with other facts and figures elicited in this investigation.

Respectfully,

V. J. BRADLEY,
Acting Chairman Subcommittee, Pneumatic Tube Commission.

POST-OFFICE DEPARTMENT,
DIVISION OF RAILWAY MAIL SERVICE,
346 Broadway, New York, November 7, 1908.

MR. ARTHUR S. TEMPLE,
President United Store Service and Tube Company,
922 Tremont Building, Boston, Mass.

DEAR SIR: No reply has yet been received from you to the letter of October 22, referring to your announcement of that date that your company was not only willing but able to introduce pneumatic-tube service similar to the present system, etc., and requesting you to submit an estimate of the cost of construction and operation in as much detail as possible.

Will you please say whether a reply may be expected within the next few days?

Respectfully,

V. J. BRADLEY,
Acting Chairman Subcommittee, Pneumatic Tube Commission.

UNITED STORE SERVICE AND TUBE COMPANY,
921 Tremont Building, Boston, November 10, 1908.

V. J. BRADLEY, Esq..
Acting Chairman Subcommittee, Pneumatic Tube Commission,
346 Broadway, New York City.

DEAR SIR: Replying to yours of November 7, we beg to say that we felt that we had already submitted to you statements of cost of the different parts of construction in the cities where construction had already been carried through to enable you to arrive at all conclusions necessary in considering any further proposed construction without having before us a definite proposition as to a system in some city. It is, of course, not practicable to submit much information beyond what we have already given you.

In a general way it might be said that the cost of construction would run from something near $30,000 per mile to $50,000 per mile under the ordinary conditions found in large cities. This is inclusive of machinery and equipment. To this actual amount, whatever it might be, any contractor would expect to add a profit, and if the contractor were furnishing special machinery, and constructing a system employing patents as well as skill in the building of it, the amount of this percentage would be increased. We should say that 25 per cent surely should be allowed, and possibly 50 per cent.

As to the cost of operation, we feel that this has already been sufficiently gone into to enable you to judge what it properly should be, and our experience is that the facts as to cost are well enough established to require no comment. The sole consideration which we have to suggest regarding cost is whether if systems are to be constructed and leased to the Government which are less than 3 miles in extent, the rental per mile should not be increased over $17,000 in order to permit a liberal reservation for a sinking fund under a ten-year contract, because in the nature of things an investment in such a system requiring but 3 miles or under would be less assured after the lapse of ten years than a more extensive one in a larger city where the need of continuing it would be increased.

By reference to our letter you will see that we said we were able to submit forthwith an estimate of the cost of construction and operation, and if given any definite proposition, we would very gladly submit you figures that could be made the basis of an agreement if so desired.

We have intended to give you the very fullest information and trust you will be able to get some light therefrom.

Respectfully,

UNITED STORE SERVICE AND TUBE COMPANY,
ARTHUR S. TEMPLE, *President.*

NOVEMBER 11, 1908.

Mr. ARTHUR S. TEMPLE,
President, etc.,
921 Tremont Building, Boston, Mass.

DEAR SIR: In your letter of November 10 (2d page) you say: "By reference to our letter you will see that we said we were able to submit forthwith an estimate of the cost of construction and operation."

The only letter we have from you is that dated July 1, addressed to the Second Assistant Postmaster-General, and as this does not contain the statement you refer to, we think it possible you may have written some other letter which has not reached us. If so, will you please furnish a copy?

Respectfully,

V. J. BRADLEY,
Acting Chairman Subcommittee.

UNITED STORE SERVICE AND TUBE COMPANY,
921 Tremont Building, Boston, November 13, 1908.

V. J. BRADLEY, ESQ.,
Acting Chairman Subcommittee,
Pneumatic Tube Commission,
346 Broadway, New York City.

DEAR SIR: Replying to yours of the 11th instant, would say the first paragraph on second page of our letter of the 10th instant should read:

"By reference to your letter you will see that we said we were able to submit forthwith an estimate of the cost of construction and operation," etc.

Yours, very truly,

UNITED STORE SERVICE AND TUBE COMPANY,
ARTHUR S. TEMPLE, *President.*

P. S.—This reference is to your letter to us of October 22.

MECHANICS TRUST COMPANY,
Boston, Mass., October 29, 1908.

Mr. V. J. BRADLEY,
346 Broadway, New York City.

DEAR SIR: Acting upon your suggestion that I make some statement as to my experience and connection with pneumatic-tube systems in order to show of record my qualification to speak about such matters, I submit the following:

Beginning in 1897 I undertook as my own property the construction of the first part of the system in Boston, running from the general post-office to the North Station, under contract with the Post-office Department. The project was then new and capital was not to be readily enlisted. Soon after this I devised and had constructed a different method of pneumatic-tube transportation which was at one time employed in the large 10-inch tube in Boston now used for mail transportation.

These different interests were finally merged and consolidated with other companies and interests, including the Lamson Consolidated Store Service Company, into the American Pneumatic Service Company. Of this latter company I was president from its organization until 1907. As president of this company I was also president of the pneumatic mail tube companies in Boston, New York, Chicago, and St. Louis, and held such office during the time of all construction in each of said cities, excepting New York, from the beginning to the completion.

I was consulted, and naturally had much to do in explaining and assisting in the passage of the legislation authorizing this service and making the appropriations for it. I negotiated the contracts with the Post-Office Department for this service in all of the cities above named. As president of the American company I negotiated for the purchase of the original system in New York City, and during my administration the major part of the construction additional to the original system in that city was carried on.

My duties related not only to the legislative and administrative parts of the business of the different companies, but I acquainted myself with, and had constant supervision over, mechanical and street construction, and also had entire charge of all the financial negotiations of the different companies.

Yours, truly,

W. E. L. DILLAWAY.

Memoranda made at New York, October 24, 1908, briefly summarizing some remarks made by Mr. W. E. L. Dillaway, of Boston, at the interview in Boston, October 23, at which he presented to the subcommittee a printed statement, dated October 1, 1908, comprising his argument against governmental purchase of pneumatic tubes.

Mr. Dillaway explained that when he heard that the pneumatic-tube commission was to come to Boston he had requested the postmaster to arrange so that he should have a hearing, and he had concluded that to present his argument in proper shape he had had it printed.

He then discussed in a cursory way the successive parts of his argument.

He expressed the opinion that his estimate of the cost of the Boston system ($436,000) and his estimate of the cost of the St. Louis system ($100,000) up to March 31, 1907, would probably be within $3,000 or $4,000 of the exact amount.

He remarked that he was a creditor of the United Stores Company, and intended to loan them more money and become a stockholder, with the view to general pneumatic-tube business, in which he was a great believer.

Being asked as to his present relation to the American Pneumatic Service Company, he said that he owned a very small amount of stock ("the price of which would not pay your railroad fare any considerable distance"), and that he owned an amount of bonds, beyond which he was not more specific.

He was asked whether, if the American Pneumatic Service Company claimed to control a monopoly of the large tube pneumatic mail business on account of controlling essential patents, the claim could be maintained. He replied emphatically that it could not. He called attention to the experimental 8-inch tube of the United Stores Company, recently installed in the old cordage works in Boston, and said that it represented a complete system, with absolutely no infringement whatever upon the patents controlled by the American Pneumatic Service Company.

In reference to the cost of the pneumatic-tube service in New York City, he said that it was almost impossible to work it out because of the stock transactions of the older companies, but expressed the opinion that $600,000 would be a fair estimate of the actual cost of pneumatic-tube service in New York City up to Forty-second street and including the New York-Brooklyn line.

He was asked where the records of the Tubular Dispatch Company could be found. He said that they were in the possession of the American Pneumatic Service Company. "They bought the company, and must have the records."

He expressed the opinion that $17,000 a mile was a fair rental for this class of service.

He still believes in the possibilities of pneumatic-tube service for commercial parcel business in cities like New York and Chicago, where the volume of business would be much larger than in Boston, where the experiment was a failure.

In regard to an allowance for maintenance, he did not have any exact knowledge, but expressed the opinion that for the maintenance of the pipes an allowance of 2 or 3 per cent per annum would be sufficient for depreciation, and for machinery 5 to 10 per cent for depreciation.

Mr. EDWIN H. PEARSON, chief engineer, post-office, subtreasury building.

Q. Are you familiar, Mr. Pearson, with the pneumatic-tube service and with the machinery employed in connection with it?—A. I am familiar with the mechanical operation of the system. You understand, of course, that I am not familiar with the handling of the mail, but that part—that is, the mechanical work of the system as installed in this building.

Q. Have you any familiarity with the cost of construction?—A. I have, to a certain extent; yes, sir. I have had knowledge from time to time of the cost of the installation in a general way. I have recently made an investigation as to the proper cost of reinstalling the present outfit and what it would cost to replace it.

Q. Could you place before us your figures as to the cost of reproducing the outfit?—A. The figures that I have would cover the installation of the compressors and the steam piping, the complete installation of the compressors and air piping. As far as the transmission of machinery, that I have no knowledge of.

Q. Could you give us an estimate as to the cost per trench foot of constructing double line of 8-inch pipe through the streets of Boston?—A. In the construction of street work I am not familiar. I have no figures on that.

Q. Will you state, Mr. Pearson, what you estimate the cost of power to be?—A. My estimate of the cost of installing the power plant, as it stands to-day, in this building is $18,000.

Q. What does that include?—A. That includes the air-compressor plant as it stands to-day, with the steam and air piping.

Q. How many machines?—A. Three compressors.

Q. What style of compressor?—A. Rand-Drill compressor.

Q. How old are they?—A. Two were installed about ten or eleven years ago and the third about five years ago.

Q. Can you name the items?—A. The items are: Cost of the 11-year-old compressors, $3,900 each, or $7,800 for both; 5-year-old compressor, $4,800; foundations, two first machines, each, $1,000, or $2,000 for both; last machine installed, $800; steam piping, $1,500; air piping, $2,000; total, $18,900. The Pneumatic Tube Company's estimate would, no doubt, be higher than mine, my figures being based on to-day's prices and for the installation of the work at one time.

Q. What is the cost of operation, i. e., attendance and steam?—A. The attendance consists of two engineers averaging about $2.50 each for seven days in the week. As regards the steam, I estimate that the coal consumption will average for seven days about 11,000 pounds per day, at a cost of $3.35 per ton. This would represent a weekly outlay of about $128.975, an annual outlay of about $6,706.70. These figures are ascertained after a series of practical tests that convince me that they are 99 per cent perfect. The Treasury Department furnishes the American Pneumatic Service Company with steam for the operation of their plant at a certain price per year.

Q. What is the annual rate?—A. I do not know the annual rate. In computing the cost of power we should be obliged to add the cost of water, about $500 per year, making the total cost $7,206.70.

In addition to this, it should be remembered that in the beginning an additional fireman was taken on at $2.50 per day, which would represent $900 additional per annum. During the cold weather the exhaust steam is used for heating the building, and this would be regarded as considerably more than an offset for the cost of the additional fireman.

Q. Can you tell us anything as to the cost of repairs?—A. One of the 11-year-old compressors, to my personal knowledge, has not required an outlay of more than $100 for the entire period of eleven years. The other 11-year-old compressor has required repairs amounting to from $500 to $600 in the eleven-year period. The 5-year-old compressor has practically required no repairs, except what was due to an accident at the time of its original installation, such as would not be met with in ordinary practice.

Q. What allowance do you think should be made in percentage for depreciation of this machinery?—A. It is customary to allow 10 per cent per annum for depreciation, but in regard to these particular machines the experience just quoted would seem to properly justify an allowance of 5 per cent.

Q. Do you think that the figures that you have just given cover all the cost of operation?—A. It would be, of course, necessary to add the cost of oil, waste, etc. This would probably be best obtained from the Boston Transit Pneumatic Company. My offhand opinion is about $40 or $50 per year.

Another variation which ought to be kept in mind is that the present company is operating on practically a twelve-hour basis for labor, whereas if the Government were operating it would be on an eight-hour basis, and of course the price of operation ought to be increased accordingly.

Informal remarks of Mr. H. A. Brigham, of the Thomas Crimmins Contracting Company, when ascertaining conditions under which bids should be made for constructing pneumatic-tube equipment.

NEW YORK, *October 26, 1908.*

I think Mr. Crimmins constructed a portion of the tubes in New York, but I never worked on tube construction.

I think there would be a great many variations in price on account of other pipes in the subways, etc., especially at intersections.

Cost of excavation in New York.—In some sections very large, but in downtown sections not so large until about Twentieth street is reached, and then you strike rock. Rock runs across the island above Twentieth and Twenty-third streets. It is continuous rock whenever found, and all requires blasting.

(Mr. Masten then described the streets occupied in New York by the present pneumatic-tube system, which data Mr. Brigham made note of.)

Conditions in Lexington and Third avenues.—Great deal of rock in Lexington avenue; Third avenue no better. Probably strike more pipes in Third avenue than in Lexington avenue. Crimmins Company built road in Lexington avenue. Conduits about 3 feet deep; manholes every 30 feet, about 6 feet deep. There is continuous rock all through Lexington avenue close to surface, and it is necessary to blast. Blasting would be very expensive work. Lexington avenue no more expensive than Amsterdam on account of more room to work and not so much obstruction. Not personally acquainted with Park avenue, but judge same conditions as Lexington avenue. Madison avenue, great deal of rock; some places rock filled sections. Madison avenue to One hundred and thirty-seventh street considerable rock on account of higher elevation. You will strike rock up to One hundred and second and One hundred and third streets, and then begin to lose rock (on Lexington avenue). Avenues east of Third avenue better, First and Second avenues being very low. Lexington avenue hardest for construction work; Third avenue next, then Madison avenue.

Q. Much difference on the route as laid out in regard to the cost of repaving?—A. There is great difference in certain sections of the city, even in the same classes of paving. Asphalt pavement in some places price is $2, whereas in other sections it is over $4. You have to pay the price to restore paving as originally laid during the continuance of the time of the original contract and at contract price.

Q. What is granite pavement worth a yard?—A. There is a variation in both granite and concrete, and also in asphalt paving. For repaving granite material may be used over. Granite work is usually laid on a 6-inch base. Variations in granite of from possibly $1 up to $2.75 or $3. Asphalt or creosote blocking may be used over again where not too much worn.

Mr. Masten described where power plants would be required for new lines to be laid. Also what is required on turns—namely, 90 degrees on bends. Also stated that bends used were patented article.

Mr. Brigham inquired whether pipes must be laid in concrete. Mr. Masten explained that it was not required.

Mr. Masten explained about manholes and drips being required about 350 feet apart.

Mr. Brigham stated that he could not at one time lay a 4-inch pipe on West Broadway between Bleecker and Grand streets at any depth on account of network of pipes, conduits, etc.

Finally agreed that Crimmins Company would submit prices on the following basis (see sheet attached).

Generally speaking, it is suggested that the estimate be presented somewhat as follows:

1. Cost of constructing 8-inch pipe line per trench foot, complete, this including excavation, laying of pipe, and furnishing pipe properly bored and machined.

2. Cost complete of projected 8-inch line from Station L at One hundred and twenty-fifth street and Lexington avenue to Station H at Forty-fifth street and Lexington avenue, with connections for Stations U, K, and Y at One hundred and third street and Third avenue, Eighty-eighth street and Third avenue, and Sixty-seventh street and Third avenue, respectively. Also including power plants at each station.

Streets with asphalt pavements.

ROUTE NO. 1.

Street.	Contractor.	Rate.	Paving guarantee expires—
Mail street	Sicilian Co	$4.00	(a)
Park row	United States and Venezuela Co.	3.63	Aug. 9, 1910
Beekman, Park row to Nassau	U. S. W. P. Co	3.23	Nov. 13, 1916
William street, Maiden lane to Liberty	Harlem Contracting Co	3.80	Aug. 2, 1912
William street, Liberty to Cedar	Hastings Co	2.90	Sept. 3, 1908
William street, Cedar to Pine	Sicilian Co	4.00	Nov. 25, 1912
Pine street, William to South	Fruin-Bambrick Co	2.88	Nov. 16, 1910
William street, Pine to Wall	Barber Co	4.00	May 1, 1907
William street, Wall to Beaver	do	4.85	Sept. 4, 1905
William street, Beaver to Stone	do	3.55	Nov. 23, 1910
Stone street, Broad to Whiteall	Fruin-Bambrick Co	3.61	Nov. 16, 1910
Whiteall street	U. S. W. P. Co	3.84	Apr. 1, 1918
Bridge street	do	3.59	May 29, 1917
Average		3.80	

a No maintenance.

Streets with asphalt pavements—Continued.

ROUTE NO. 2.

Street.	Contractor.	Rate.	Paving guarantee expires—
Mail street	Sicilian Co	$4.00	(a)
Park row	United States and Venezuela Co.	3.63	Aug. 9,1910
Average		3.85	

ROUTE NO. 3.

Mail street	Sicilian Co	$4.00	(a)
Park row to Bridge street	United States and Venezuela Co.	3.63	Aug. 9,1910
Mulberry, Park row to Broome	Atlantic	3.18	Aug. 19,1911
Mulberry, Broome to Bleecker street	Barber Co	3.95	Aug. 7,1908
Lafayette place, Great Jones to Astor	Sicilian Co	2.50	May 10,1910
Astor place	Warren-Scharf Co	3.24	Apr. 15,1915
Fourth avenue, Astor to Sixth street	Sicilian Co	2.50	Aug. 15,1911
Fourth avenue, Eighth to Twenty-fourth streets.	Uvalde Co	2.50	Apr. 11,1910
Fourth avenue, Twenty-fourth to Thirty-second streets.	Barber Co	2.50	Nov. 17,1908
Fourth avenue, Thirty-second to Thirty-third streets.	Interurban R. R. Co		
Fourth avenue, Thirty-third to Thirty-fourth streets.	T. Hugh Boorman	2.75	Oct. 24,1906
Park avenue, intersection of Thirty-fourth street.	Barber Co	3.29	Oct. 31,1913
Park avenue, Thirty-fourth to Fortieth streets	do	4.00	Apr. 15,1905
Park avenue, Fortieth to Forty-first streets	do	2.18	Nov. 22,1911
Park avenue, Forty-first to Forty-second streets	Harlem Contracting Co	2.23	Aug. 30,1911
Forty-second street	Sicilian Co	3.00	Oct. 6,1910
Vanderbilt avenue	do	3.00	Aug. 14,1912
Average		3.05	

ROUTE NO. 4.

Mail street	Sicilian Co	$4.00	(a)
Broadway	U. S. W. P. Co	4.08	June 2,1916
Park place	do	3.63	Nov. 2,1916
University place	Barber Co	4.34	Apr. 15,1912
Broadway	Mack Paving Co	6.30	Apr. 1,1916
Seventeenth street	Uvalde Co	3.11	Oct. 22,1911
Average		4.25	

ROUTE NO. 5.

Seventeenth street to Sixth avenue	Barber Co	$3.63	Nov. 26,1905
Seventeenth street to Seventh avenue	do	3.23	Nov. 6,1911
Seventh avenue to Twenty-third street	Warner, Quinlan Co	3.98	June 20,1912
Seventh avenue, Twenty-third to Thirty-first streets.	Barber Co	3.95	Apr. 15,1912
Thirty-first street	Sicilian Co	2.99	Nov. 30,1912
Sixth avenue to Thirty-third street	Atlantic Co	3.57	Nov. 19,1910
Sixth avenue to Thirty-fifth street	Mack Paving Co	5.37	Apr. 1,1916
Thirty-fifth street, Sixth to Ninth avenues	Sicilian Co	2.99	Oct. 14,1912
Thirty-sixth street	Uvalde Co	3.00	Aug. 24,1908
Thirty-seventh street	Sicilian Co	3.00	Oct. 11,1910
Thirty-eighth street	Uvalde Co	3.00	Aug. 11,1909
Thirty-ninth street	Sicilian Co	2.94	July 16,1912
Fortieth street	Fruin-Bambrick Co	3.19	Apr. 15,1911
Forty-first street	Sicilian Co	2.94	July 28,1912
Forty-second street	Continental Co	3.00	Aug. 24,1908
Forty-third street	Uvalde Co	3.00	Sept. 1,1908
Forty-fourth street	Barber Co	2.93	Aug. 3,1911
Forty-fifth street	Uvalde Co	3.00	Sept. 10,1908
Forty-sixth street	do	3.00	Oct. 10,1908
Forty-seventh street	Barber Co	2.65	Aug. 19,1911
Forty-eighth street	Silician Co	3.07	Aug. 13,1913
Forty-ninth street	Atlantic Co	3.12	Apr. 15,1915
Fiftieth street	Sicilian Co	3.00	Apr. 1,1908
Fifty-first street	do	3.09	Aug. 27,1912
Eighth avenue	Barber Co	3.00	Oct. 20,1911

(a) No maintenance.

Streets with asphalt pavements—Continued.

ROUTE NO. 5—Continued.

Street.	Contractor.	Rate.	Paving guarantee expires—
Fifty-second street	Sicilian Co	3.09	Aug. 27, 1912
Fifty-third street	do	3.00	Aug. 4, 1912
Fifty-fourth street	do	3.00	Do.
Fifty-fifth street	do	2.79	Aug. 16, 1910
Fifty-sixth street	Harlem Contracting Co	2.10	Aug. 29, 1912
Fifty-seventh street	do	2.50	Aug. 28, 1912
Tenth avenue, Fifty-eighth to Fifty-ninth streets.	Sicilian Co	3.66	Nov. 5, 1907
Amsterdam avenue, Fifty-ninth to Sixtieth streets.	do	3.50	Nov. 6, 1911
Amsterdam avenue, Sixty-eighth to Sixty-ninth streets.	do	3.50	Apr. 1, 1908
Amsterdam avenue, Sixty-ninth to Seventy-first streets.	do	3.50	July 9, 1909
Amsterdam avenue, intersection Seventy-second street.	Standard Co	2.74	Sept. 14, 1910
Amsterdam avenue, Seventy-second to Seventy-third streets.	Asphalt Construction Co	3.00	Oct. 10, 1911
Amsterdam avenue, Seventy-third to Seventy-seventh streets.	do	3.00	June 28, 1911
Amsterdam avenue, Seventy-seventh to Seventy-eighth streets.	Barber Co	3.00	Oct. 10, 1909
Amsterdam avenue, Seventy-eighth to Eighty-fourth streets.	Sicilian Co	3.00	Oct. 30, 1912
Eighty-fourth street	Warren-Scharf Co	3.06	Apr. 15, 1913
Amsterdam avenue to Eighty-sixth street	Sicilian Co	3.00	Oct. 30, 1912
Amsterdam avenue, Eighty-sixth to Nintieth streets.	Barber Co	3.00	Oct. 10, 1909
Amsterdam avenue, Ninety-third to Ninety-fourth streets.	Asphalt Construction Co	3.00	Oct. 27, 1907
Amsterdam avenue, Ninety-sixth to Ninety-seventh streets.	do	3.00	Oct. 5, 1912
Amsterdam avenue, Ninety-ninth to One hundredth streets.	Barber Co	3.00	Oct. 10, 1909
Amsterdam avenue, One hundred and fourth to One hundred and fifth streets.	do	3.00	Nov. 10, 1907
One hundred and fifth street	Hastings Co	2.39	Nov. 26, 1907
Manhattan street, One hundred and fifth to One hundred and sixth streets.	do	2.56	June 2, 1909
Manhattan street, One hundred and sixth to One hundred and tenth streets.	do	3.13	July 18, 1901
Manhattan street, One hundred and tenth to One hundred and sixteenth streets.	Uvalde Co	3.00	Nov. 9, 1910
Manhattan street, One hundred and sixteenth to One hundred and twentieth streets.	Asphalt Construction Co	3.00	July 31, 1910
Manhattan street, One hundred and twentieth to One hundred and twenty-fourth streets.	do	3.00	May 12, 1910
One hundred and twenty-fourth street to Eighth avenue.	do	3.00	Aug. 1, 1909
One hundred and twenty-fourth street to Seventh avenue.	do	3.00	Apr. 1, 1908
One hundred and twenty-fourth street to Mount Morris.	do	2.86	May 24, 1911
One hundred and twenty-fourth street to Fifth avenue.	Barber Co	3.58	July 31, 1906
One hundred and twenty-fourth street to Madison avenue.	do	3.01	Oct. 23, 1912
One hundred and twenty-fourth street to Park avenue.	do	3.12	Oct. 12, 1911
One hundred and twenty-fourth street to Lexington avenue.	Asphalt Construction Co	3.00	Oct. 6, 1907
Lexington avenue to One hundred and twenty-fifth street.	Barber Co	3.00	Sept. 1, 1908
Average		3.15	

NEW LINES.

Lexington avenue, One hundred and twenty-fifth to One hundred and nineteenth street.	Barber Co	$3.00	Sept. 1, 1908
Lexington avenue, One hundred and nineteenth to One hundred and sixth street.	do	3.00	Sept. 12, 1909
Lexington avenue, One hundred and sixth to One hundred and fifth street.	do	3.00	Apr. 1, 1908
Lexington avenue, One hundred and fifth to One hundred and third street.	do	3.00	Sept. 12, 1909

Streets with asphalt pavements—Continued.

NEW LINES—Continued.

Street.	Contractor.	Rate.	Paving guarantee expires—
Lexington avenue, One hundred and first to Ninety-seventh streets.	Atlantic Co	3.00	Nov. 30, 1902
Lexington avenue, Ninety-sixth to Ninety-fifth street.	Continental Co	2.50	May 26, 1909
Lexington avenue, Seventy-seventh to Seventy-sixth street.	Sicilian Co	3.00	June 16, 1910
Lexington avenue, Seventy-sixth to Seventy-fifth street.	Asphalt Construction Co	3.00	Aug. 23, 1911
Lexington avenue, Seventy-third to Seventy-second street.	.....do	3.00	Aug. 15, 1911
Lexington avenue, Sixty-ninth to Sixty-sixth street.	Barber Co	4.15	Apr. 15, 1906
Lexington avenue, Fifty-ninth to Forty-fifth street.	.....do	4.15	Do.
One hundred and third street to Third avenue	Asphalt Construction Co	3.00	Sept. 9, 1909
Eighty-eighth street to Third avenue	Barber Co	3.00	July 11, 1908
Sixty-eighth street to Third avenue	.....do	3.62	Nov. 20, 1906
Average		3.15	
Thirty-ninth street and Ninth avenue:			
Thirty-ninth street, Ninth to Eighth avenue	Sicilian Co	2.94	July 16, 1912
Thirty-ninth street, Eighth to Seventh avenue	Uvalde Co	3.00	June 2, 1908
Thirty-ninth street, Seventh to Broadway	Sicilian Co	3.12	Sept. 27, 1911
Thirty-ninth street, Broadway to Sixth avenue	Barber Co	3.58	Aug. 3, 1910
Thirty-ninth street, Sixth to Fifth avenue	Sicilian Co	3.47	Aug. 21, 1906
Thirty-ninth street, Fifth to Madison avenue	Barber Co	3.23	Apr. 15, 1911
Thirty-ninth street, Madison to Park avenue	.....do	3.58	Nov. 30, 1909
Thirty-ninth street, Park to Lexington avenue	.....do	2.97	May 28, 1912
Lexington avenue, Forty-second to Forty-fifth street.	.....do	4.15	Apr. 15, 1906
Average		3.50	
Seventeenth street and Fifth avenue—Average		3.50	
Seventeenth street, Fifth to Sixth avenue	Barber Co	3.63	Nov. 26, 1905
Seventeenth street, Sixth to Seventh avenue	.....do	3.23	Nov. 6, 1911
Seventh avenue	Warren-Quinlan Co	3.98	June 20, 1912
Thirteenth street, Seventh to Greenwich	Sicilian Co	3.00	Aug. 4, 1908
Average		3.35	

OFFICE OF R. D. WOOD & CO.,
400 Chestnut Street, Philadelphia, October 27, 1908.

H. S. BRIGHAM,
Engineer Thomas Crimmins Contracting Company,
444 East Sixty-ninth Street, New York, N. Y.

DEAR SIR: The request contained in your esteemed favor of October 26 is duly noted. The best we can do for you is to name the price per foot of the bored 8-inch pipe. It, after boring, weighs approximately 50 to 52 pounds a foot, but that which, of course, has to be cast of a much heavier weight and special iron bringing in extra costs above the normal cast-iron pipe. For estimating purposes it is safe to figure on $1.40 per foot f. o. b. our foundry, adding a freight of 9 cents per hundred for shipments to New York City in carload lots. This figure is subject to fluctuations in the prices of pig iron, but we believe is within a proper limit, so that calculations may be based upon it.

We regret our inability to give you prices on the bends and special pieces used in the construction of this work. Formerly we understand they were made of copper, but are now in cast iron and bored by special machinery. We also understand that the George V. Cresson Company, of Philadelphia, are in a position to do this work; but on our inquiring costs to-day we were told by them that unless detailed figures as to lengths and other specifications were given them they could not name us figures.

We note you call for 6-foot lengths. If these are to be straight pipes of course they are merely sections of the 12-foot lengths and cost only the extra cost of cutting if they are to be plain pieces, some of them without bell. Such flange pipes as might be required not bored would cost approximately 1¼ cents per pound, but the cost of boring would depend upon their length, as tools are

fitted for boring only standard 12-foot lengths bell and spigot pipes, and boring of flange pieces would entail an extra arrangement.

We trust this information will be satisfactory for your needs and will be pleased to hear from you in reply to this letter at your early convenience as to just exactly what is going on in this connection, as we would be glad to take part in the work when it is ready for definite action.

Yours, truly,

R. D. WOOD & Co.,
By E. F. KREWSON.

---

350 FULTON STREET, BROOKLYN, N. Y., *October 12, 1908.*

Hon. G. H. ROBERTS,
Postmaster, Brooklyn, N. Y.

DEAR SIR: Complying with your request for an approximate estimate of the cost of installing an 8-inch pneumatic dispatch system under the same conditions and similar to that now existing in Brooklyn, I submit the following figures, based upon the present prices of labor and material:

1 mile of 8-inch tube	$42,240.00
2 terminal equipments	6,000.00
1 power plant, exclusive of steam plant	6,000.00
50 carriers	1,000.00
	55,240.00
15 per cent incidentals and contingencies	8,286.00
	63,526.00

A plant with a 3-inch tube will cost about 30 per cent less.

It must be remembered that the cost will vary with the fluctuations in the price of materials and labor.

Yours, very truly,

A. T. BYRNE.

Interview held at New York, November 2, 1908, between Superintendent Bradley and Mr. A. T. Byrne, civil engineer and surveyor, 350 Fulton street, Brooklyn, also of the firm of M. & J. Dady, contractors; Postmaster Roberts, of Brooklyn, and Assistant Superintendent Norris also present.

Q. Will you state briefly the experience you have had that qualifies you to speak advisedly regarding the cost of pneumatic-tube installation?—A. As an engineer I had experience in laying water pipes in Brooklyn, which is similar to pneumatic-tube work, and I have investigated pneumatic service extensively both in Washington and Brooklyn, with the purpose of installing it, and while I have not installed any, I have large experience in pneumatic machinery, etc., both as to price and installation.

Q. Do I understand that you submitted a formal bid to the department for proposed Washington tube service?—A. No; we did not submit it, but prepared it.

Q. Are you able, offhand, to divide the item in your statement "cost of 1 mile of 8-inch tube" into its component parts?—A. Yes; as follows:

	Per foot.
Tearing up and removing pavement	$0.30
Excavating	.30
Pipe and lead for joints	4.80
Laying pipe (labor principally)	1.15
Back filling	.15
Repaving	.15
Miscellaneous	1.00
	7.85

The last item ($1 per foot) includes contractor's profits, but no patent rights. It would be necessary to acquire patent rights for terminal equipment and carriers.

Q. What kind of pavement do you deal with?—A. Most any kind—granite or asphalt. Necessary width of trenches for pneumatic work only about 4 feet wide.

Q. Do you think the above figures could be shaded any?—A. Not much. You might shade a little—possibly 50 cents.

Q. Are you estimating not only for the pipe, but for the boring and machinery?—A. Yes.

Q. How much for the pipe per foot?—A. About $2. Contractor is required to stand loss for breakage.

Q. We are told they have patents on the bends. At the beginning they used brass bends, but they were expensive, so that they are replaced with cast-iron bends of 90 and 45 degrees bend. Steel was also unsatisfactory. What is your opinion?—A. If cast-iron is satisfactory, steel would be more so.

Q. Do you think it advisable to use pipe without boring?—A. Yes.

Q. Suppose we had unbored pipe; do you think the breakage on the carriers would mean a great amount of expense in that direction?—A. No, sir.

Q. Your opinion is that unbored pipe might be used?—A. Yes, sir; you could easily take off 50 cents per foot on the unbored pipe over the bored pipe.

Q. What weight of pipe have you been figuring on?—A. About 700 pounds for 12-foot lengths (about 60 pounds per foot).

Q. Do you think that the patents as regards bends would prevent construction?—A. No, sir.

Q. Terminal equipment, $6,000; how are you able to estimate this?—A. The installing of that is really worth more than the material in it.

Q. As regards patents, we would have to deal with royalties?—A. Yes; that would be additional. We would have to buy them from the patentees.

Q. Has the United States Pneumatic Company a system of its own?—A. Oh, yes.

Q. Is it independent?—A. Perfectly independent.

Q. Is the company in a position to make a bid to the Government for this class of service?—A. Yes.

Q. What would be the difference of price in installation by your company?—A. The difference is probably a little less under the vacuum system. Instead of compressing air we exhaust air.

Q. Inasmuch as the pneumatic-tube system is being extended, and it is operated in sections, from station to station, would there be anything to prevent the vacuum system from being put in for further extensions?—A. No; nothing at all. I will have my company make a proposition.

Q. Have you made any calculation to indicate what probable cost of operation per mile would be?—A. No; I have not.

Q. You are interested in the other company?—A. Yes; but I am more interested in construction work.

Q. Has this other company laid any tubes as yet?—A. No; not as yet. If any other system was constructed by our company we would have to buy the patents for their system. We have our own patents for the vacuum system.

Q. Would you have to get patents as regards carriers?—A. No; we use a different carrier from the others.

Q. How do they differ?—A. It is a rolling carrier, and has guiding wheels, thus getting rid of the boring of pipes.

Q. Is your rate for laying tubes based on average condition of pavements in Brooklyn?—A. Yes, sir.

Q. Could the Government save by establishing a unit price for contract work; that is, if it contracted to have the tubes laid and fixed a unit price per trench foot, depending upon the class of pavement?—A. Yes; but the price would vary under different conditions. Also, the eight-hour labor law would come in. We figure on ten hours per day.

Mr. ROBERTS. In case of purchase, would the Government have more difficulty in repairing breaks, etc., than the company?—A. There would be slight handicap there, but the company would take care of it for a certain number of years, say, five or ten years, as the case may be. For this the company would want additional compensation for ten years, say, about 8 cents per square yard.

Mr. BYRNES. What is the rate for asphalt pavement per square yard?—A. It varies. It consists of two parts. The foundation is worth about $1 or $1.25 per square yard. The surface is not worth over 75 cents in Brooklyn; in other places, $1 or $1.50. Normally, about $2.50 per square yard complete.

Q. What other pavement do you encounter in Brooklyn?—A. Granite-block pavement, costing about $2.10 per square yard; but it is customary to use old material over again, in which event 30 cents per square yard would be a sufficient allowance for repaving.

(Mr. Byrne explained that he was interested in the United States Pneumatic Tube Company, of 276 Broadway; president, Mr. Hurlbutt. They had done no

pneumatic-tube work as yet, but had been organized for several months. Mr. Byrne thought they would make a proposition to the Government for installing and operating a vacuum system.)

UNITED STATES PNEUMATIC COMPANY,
74 Broadway, New York City, November 23, 1908.

Mr. V. J. BRADLEY,
Chairman of Subcommittee,
Investigating Pneumatic Tubes,
346 Broadway, New York City.

DEAR SIR: Complying with your verbal request to Mr. A. T. Byrne and to Mr. C. H. Burton, we herewith hand you our proposition to build an 18-inch pneumatic tube line, between the general post-office and the Union Station at Washington, D. C., addressed to the Second Assistant Postmaster-General.

We will be pleased to give any other information relating to our system or to the company.

Very truly, yours,

UNITED STATES PNEUMATIC COMPANY,
JOHN HENRY HURLBUTT,
Assistant Secretary.

UNITED STATES PNEUMATIC COMPANY,
74 Broadway, New York, November 23, 1908.

Hon. JOSEPH STEWART,
Second Assistant Postmaster-General, Washington, D. C.

SIR: Complying with a verbal request of Mr. V. J. Bradley, of the local tube committee, we beg to submit the following proposition for the operation or sale of an 18-inch mail tube between the general post-office and the Union Station at Washington, D. C.

We have selected the most direct route, namely, from the post-office, north along Eleventh street to E street, thence east through E street to a point in the Plaza opposite southeastern end of the station, making the distance about 7,355 feet.

Our tubing is standard cast-iron water pipe (not bored), laid and jointed in the usual manner, except that greater care is used in making the joints to secure an even inner surface where ends of tubes come together. These tubes are to be 18 inches inside diameter, and made of best quality of metal.

The carriers are to be 36 or 38 inches long, inside measurement, and 17 inches inside diameter.

Our terminals and carriers are to be built under patents owned and controlled by the United States Pneumatic Company, and copies of which, together with a map of the route, are herewith submitted.

The charge for power is based on standard contract price per kilowatt hour, but if the Government should furnish the power the price for that item would be materially reduced.

The cost of operation would be further reduced if the Government furnished the operators, because tubes of the size named would be in operation only at stated periods, for the sending of mail at regular train arrivals or departures, and the operators could be otherwise employed and only a portion of the time of these men would be chargeable against the tubes.

Our system is operated by the vacuum principle, and, therefore, uses less power, and the lines are free from moisture, which is a decided advantage over compressed-air systems.

We propose to install the complete doube line between the points named and lease the same, subject to regulations governing pneumatic-tube service, and to furnish such bonds as may be required by the Government, for the sum of $22,500 per annum for a period of five years or more.

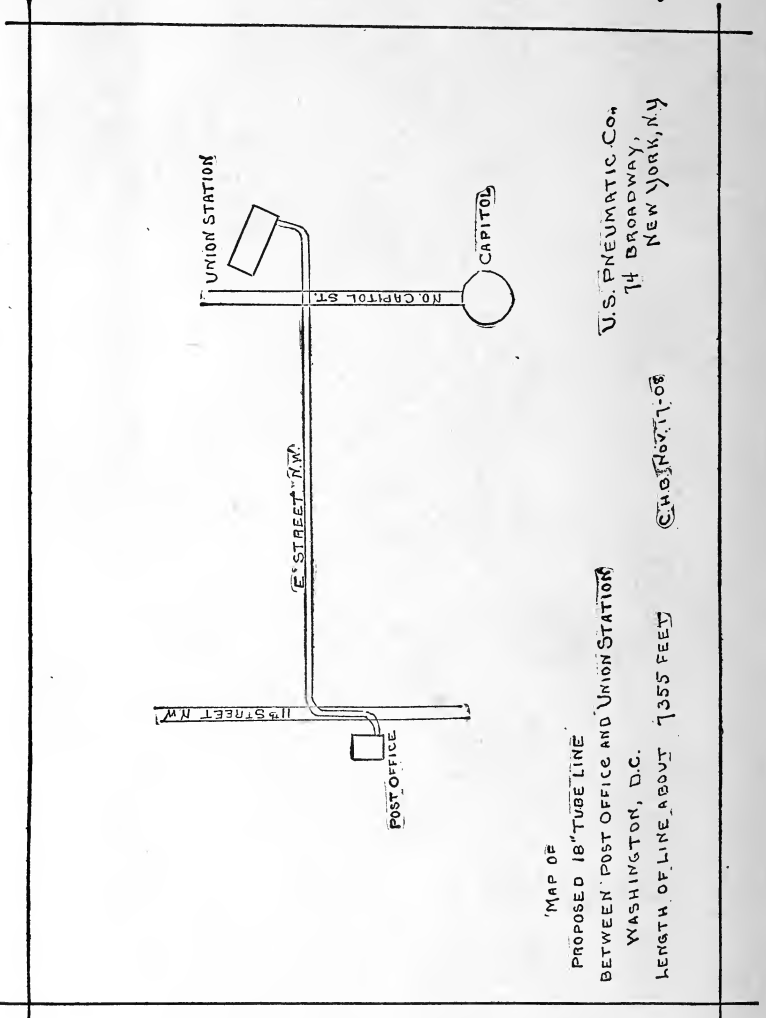
We also propose to make a complete installation of this system as above outlined and sell to the Government for the net sum of $225,000.

We do not limit ourselves to an 18-inch tube, but are ready and willing to substantially increase or decrease the size mentioned above, and we are also ready to bid on the construction of mail-tube systems in any city where the Government may plan to adopt pneumatic-tube service for the handling of the United States mails.

We are about to build in Washington, D. C., an 18-inch diameter tube to demonstrate the practical operation of a tube of size named, and expect to have same ready for your inspection within a few weeks.

Very respectfully,

UNITED STATES PNEUMATIC COMPANY,
JOHN HENRY HURLBUTT,
Assistant Secretary.



NOTE.—Attached to the original letters from the United States Pneumatic Company are copies of specifications of letters patent No. 847233 and No. 847234, dated March 12, 1907.

GENERAL ELECTRIC COMPANY,
New York Office, 30 Church Street, October 26, 1908.

UNITED STATES RAILWAY MAIL SERVICE,
346 Broadway, New York City.
Attention of Mr. V. J. Bradley, *Superintendent.*

DEAR SIRS: Referring to your inquiry regarding motors for driving air compressors, which we understand are to be direct-current, 220 volts, we give you below close approximate prices covering belted motors with pulleys, bases, and rheostats f. o. b. our factory. These motors are suitable for driving the ordinary compressors.

25-horsepower, 635 revolutions per minute, motor	$446
35-horsepower, 610 revolutions per minute, motor	509
50-horsepower, 560 revolutions per minute, motor	680
65-horsepower, 540 revolutions per minute, motor	820
90-horsepower, 470 revolutions per minute, motor	1,050
120-horsepower, 500 revolutions per minute, motor	1,540

These motors are all designed to carry their full loads continuously, without injurious heating, and 25 per cent overload for two hours.

Trusting that this covers your requirements, we remain,
Yours, truly,

GENERAL ELECTRIC COMPANY.
By LEWIS F. BURROUGH.

NEW YORK, *November 7, 1908.*

POSTAL-SERVICE COMMISSION,
Mr. V. J. BRADLEY, *Chairman,*
346 Broadway, New York City.

DEAR SIR: We inclose herewith report regarding the three different problems submitted to the writer for the postal pneumatic tube service. We have made you as close estimates as was possible under the conditions, and believe the prices, weights, and floor space will be amply close for your present purposes. Should you, however, desire to have these exact, we would take pleasure in getting blueprints of the proper motors and make up combined drawings so that your information would be exact.

It may be that on the 1⅔ and half-mile lines you would prefer to have the same design of machine as is used on the 2½ mile; but unless there is some intention of making these outfits interchangeable in their parts, or cross-connected, so that any one can assume the service of the other, a condition which would need the maximum size motor, we do not see the advantage of having them all alike; in fact, there seems to be a decided disadvantage, and the logical method would be to have each machine and motor proportioned for the work it is to do, thereby gaining the maximum efficiency for each individual installation.

Should there be any further questions which your commission would like to have answered, or anything that is not clearly understood, kindly advise and we will endeavor to place it before you so that there shall be absolutely no misunderstanding on the subject.

Appreciating the courtesies offered the writer by the commission, we are,
Yours, truly,

P. H. & F. M. ROOTS COMPANY,
Per GEO. C. HICK, Jr., *Engineer.*

NEW YORK, *November 7, 1908.*

POSTAL SERVICE COMMISSION,
Mr. V. J. BRADLEY, *Chairman,*
346 Broadway, New York City.

DEAR SIR: In accordance with our promise, we herewith submit our recommendations for blowers and motors to accomplish the work of pneumatic-tube service carriers under problems Nos. 1, 2, and 3:

Problem No. 1.

Line, 2½ miles long; size of tube, 8 inches; number of carriers, 4 per minute; weight of carrier, 25 pounds, loaded; speed of carrier, 30 miles per hour.

Using a safe coefficient of friction of 0.5, each carrier requires

$$\frac{25 \times .5}{\text{sq. in area}} = \frac{12\frac{1}{2}}{50} = .25 \text{ pound},$$

the differential pressure between any two carriers.

Eight-inch diameter equals 50 square inches area.

In a line $2\frac{1}{2}$ miles long there would be 20 carriers at any one time, figured as follows:

Velocity one-half mile a minute takes five minutes to traverse $2\frac{1}{2}$ miles, and 4 carriers per minute equals 20 carriers; each one 0.25 pound differential makes a total of 5 pounds.

To obtain a velocity of 2,640 feet per minute through an 8-inch pipe requires $\frac{2640 \times 8'' \text{ diameter} \times .7854}{144} = 917$ cubic feet per minute. This amount of air through an 8-inch pipe $2\frac{1}{2}$ miles long consumes 4 pounds, making a total loss of 9 pounds, which must be the initial pressure at the machine.

To give a net delivery of 917 cubic feet, the machine requires a gross displacement of 1,200 cubic feet and consumes 52 horsepower. To take care of tight carriers and other contingencies a 60-horsepower motor having a speed variation of from 300 to 350 revolutions and a maximum output of 73 horsepower would be proper.

Floor space required, 10 feet long and 5 feet wide.

	Approximate price.	Weight.
		Pounds.
Motor	$1,000	8,000
Blower	1,000	10,000
Muffler	50	500
	2,050	18,500

Problem No. 2.

Line, $1\frac{3}{4}$ miles; size of tube, 8 inches; number of carriers, 4 per minute; weight of carrier, 25 pounds, loaded; speed of carrier, 30 miles per hour.

Figuring as before, $1\frac{3}{4}$ miles allows 13 to 14 carriers at any one time at a 0.25-pound differential, making $3\frac{1}{2}$ pounds total pressure; loss of pressure in 8,800 feet of 8-inch pipe, $3\frac{1}{2}$ pounds; total pressure at machine, 7 pounds.

Horsepower required, 38 per minute, with same overload allowance as before and same speed variation.

Floor space required, 8 feet long by $4\frac{1}{2}$ feet wide.

	Approximate price.	Weight.
		Pounds.
Motor	$800	6,000
Blower	825	8,000
Muffler	50	500
	1,675	14,500

Problem No. 3.

Line one-half mile long; size of tube, 8 inches; number of carriers, 4 per minute; weight of carrier, 25 pounds, loaded; speed of carrier, 30 miles per hour.

Number of carriers in tube at any instant equals 4; at 0.25 pound per carrier this equals 1 pound pressure per square inch. Loss of pressure in one-half mile of 8-inch pipe, velocity 2,640 feet per minute, $1\frac{1}{4}$ pounds; total, $2\frac{1}{4}$ pounds at blower.

Horsepower required, 15 per minute, with same overload allowance as before and same speed variation.

Floor space, 8 feet long by 4 feet wide.

	Approximate price.	Weight.
		Pounds.
Motor	$500	5,000
Blower	750	7,000
Muffler	50	500
	1,300	12,500

Respectfully submitted.

P. H. & F. M. ROOTS COMPANY,
Per GEO. C. HICKS, Jr.

P. S.—In case it was desired to operate these tubes with a vacuum instead of pressure, the increased power consumption would amount to about 5 per cent on the one-half-mile line, 10 to 12 per cent on the 1¾-mile line, and 20 per cent on the 2½-mile line. The additional cost would not be very great, probably nothing on the one-half-mile line and not over 10 per cent on the other two.

PHILADELPHIA, PA., *October 20, 1908.*

HEARING OF SUBCOMMITTEE, PNEUMATIC-TUBE INVESTIGATION.

Present: Messrs. Bradley, Masten, Norris; and as witnesses, W. S. P. Shields, general contractor, 605–606 Witherspoon Building, Philadelphia, and Henry Birkinbine, hydraulic engineer, same address.

Mr. BRADLEY. Mr. Shields, will you please state briefly your experience in the work of excavating street openings which enables you to speak adviseldy before this committee?

Mr. SHIELDS. Experience of fifteen years in Brooklyn, N. Y.; Philadelphia, Baltimore, Washington, St. Louis, and other cities.

(Question repeated to Mr. Birkinbine.)

Mr. BIRKINBINE. I have built waterworks and gas works in various parts of this country for the last thirty-five years; digging up streets, laying pipes, repaving, etc. I have done work as far north as Montana and as far south as Arizona.

Mr. BRADLEY. Now, Mr. Masten, will you take up the question of the local conditions?

Mr. MASTEN. Mr. Shields, as Mr. Bradley has stated, the inquiry is relative to the purchase of the present system of pneumatic tubes, and on that question we are dealing with the owners. The law also provides that we shall ascertain the cost of installing and operating the pneumatic tube, for the information of Congress, with the supposition that the Government would go into the matter of building and operating pneumatic tubes or in case Congress should authorize the purchase of same. The present pneumatic-tube lines are laid from the post-office in three different directions, viz, east on Chestnut street to what is known as the Bourse Station, and from the post-office to the small street in the rear and on Tenth street, where one line goes out Filbert street, the other up Tenth to Tenth and Columbia avenue, another line running through Filbert street to Broad Street Station, and from there up Nineteenth street to Station C, Nineteenth and Oxford streets. Another line running south on Tenth street to Southwark Station, Tenth and Washington avenue, thence out Carpenter street to Station D (southwest), Eighteenth and Christian streets. Taking that section as a representative section, and the streets named as representative as far as cost of building a pneumatic-tube line, could you separate the cost of such construction into items such as excavating trench, laying pipe, refilling, repaving, and putting the street back into proper condition?

Mr. SHIELDS. That is, take up the whole system and give full cost? Yes; I think we can get at the actual cost; but as to an estimate, I could not give that offhand. I could give the cost of excavating now. As to the cost of the pipe, if they use a cast-iron pipe bored out, I know what that pipe costs, and I

would figure as to what the boring would cost. I know what the laying would cost and the cost of digging up the street and restoring same.

Mr. MASTEN. Could these charges be separated and itemized?

Mr. BIRKINBINE. I should say that, in order to avoid any misunderstanding, each item of cost should be fully explained. I would be very much pleased if Mr. Shields would go to work and make an estimate on this matter.

Mr. SHIELDS. What you want is the average cost of each of these streets. You know in the city we meet obstructions such as gas pipes, water pipes, drain-pipes, etc. In the country we could dig and lay pipe for 15 cents per foot, while it would cost 55 cents a foot to come out Chestnut street and do the same work.

Mr. MASTEN. You are pretty well acquainted with this character of work; I might mention, however, that these tubes are laid in pairs, or double, for a line working in each direction. It is usual to lay them together in the same trench.

Mr. BRADLEY. What would the expense be by the foot—that is, the running or linear foot—regardless of width?

Mr. SHIELDS. Special casing would increase the cost some little; for instance, we pay 3½ cents per pound for them and they are 3 feet long. That will be all covered in our omissions.

Mr. BRADLEY. What do you know about Kalamine tubing?

Mr. BIRKINBINE. Kalamine pipe is made at McKeesport, Pa. I have laid it in Council Bluffs, Iowa, South Bend, Ind., Lincoln, Nebr., Omaha, Nebr., Helena, Mont., and my son is now laying it at Haines, Alaska, for supplying water to the fort—8,000 feet of pipe to supply Fort William H. Seward. It is used for water supply at Lincoln, Nebr., where it was put down in 1882 and has been in use ever since. My reports are that it is still in good condition. The pipe at South Bend, Ind., is placed in salt soil; this pipe is all right yet, although it was put down in 1873.

Mr. MASTEN. What is the character of the pipe?

Mr. BIRKINBINE. It is a steel or wrought-iron pipe covered with lead.

Mr. MASTEN. Is the interior smooth?

Mr. BIRKINBINE. Yes; it is as smooth as can be.

Mr. BRADLEY. Is the use of it and is its life much prolonged by the cover?

Mr. BIRKINBINE. I should think so; for that is the salvation of wrought-iron pipe. I have laid these pipes in a salt creek near Lincoln, Nebr., where they have stood the salt for years. There is about 43 pounds pressure on it all the time. This is a very high pressure. The pipe is not heavy; you and I could take up 20 or 25 feet of that pipe and carry it. We can make any kind of curve in it; we can fill it full of sand and make any bend you want, same as they bend rails.

Mr. MASTEN. Could it be used with cast-iron pipe to go around street corners?

Mr. BIRKINBINE. Yes; it could. No trouble about that.

Mr. BRADLEY. What about steel pipes?

Mr. BIRKINBINE. Steel, of course, is in its infancy. We have adopted steel in my lifetime, and we do not know how long it will last; it is, of course, an experiment.

Mr. BRADLEY. Can you state approximately what would be the average cost of laying pipe for pneumatic-tube service, including all expenses?

Mr. BIRKINBINE. I think I can state approximately; it would be about as follows (for 6-inch tube):

40 pounds iron, at 1½ cents	$0.60
¾ pound lead, at 6 cents	.04
Jute	.01
Handling and fuel	.01
Boring pipe	.50
Excavations, back filling, and paving	.33
Supervision	.02
Extras	.01
	1.52
Omissions, 10 per cent	.15
	1.67

For a double 6-inch line the total cost would be about $3.04 per foot.

For an 8-inch line the cost would be approximately as follows: 60 pounds of iron in lieu of 40 pounds; nine-tenths of a pound of lead in lieu of three-

fourths of a pound; boring, about one-third more, or 66 cents; extras, about 1¼ cents in lieu of 1 cent—making about $1.99 for a single line, or $3.98 for a double line of 8-inch pipes.

To the above figures might be added 15 per cent to cover contractor's profit, and the outside cost is ascertained.

This would be taking chances of difficulties that would be encountered in the city of Philadelphia, except crossing rivers and streams. In Philadelphia practically no rock is found in such excavations as we have been figuring on.

Mr. BRADLEY. Would it be of advantage to the Government to have a sliding scale of units in consideration of the different pavements encountered—that is, would there be any economy?

Mr. BIRKINBINE. The price we have given you is $2 per yard. If it is brick, we can use the bricks; any pavement, except asphalt, we can put back.

Mr. BRADLEY. Mr. Shields, would there by any advantage to the Government in contracting for this work piecemeal, or would it be better to give the entire work to one contractor?

Mr. SHIELDS. Yes; in my judgment the only way and the more economical way would be for the Government to select a reliable man whom they are satisfied will do the work properly, allow him to make all purchases—the machinery and the different materials used; submitting all contracts to the officer designated, as well as all proposals for labor, and would suggest that an inspector and a timekeeper be placed upon the work, that there should be no question as to the number of men employed and the number of hours that they work. By doing the work in this manner, with one contractor, a saving could be made to the Government of from 10 to 20 per cent.

Mr. MASTEN. Are the rules and regulations of the department of highways dated November 8, 1906, still in force in relation to laying of conduits, manholes, and the laying of pipes?

Mr. SHIELDS. Yes.

Mr. BRADLEY. In case of making a contract like that, Mr. Shields, what is the usual amount of bond?

Mr. SHIELDS. The usual amount would be the amount of pay roll; or the contractor might give any required sum up to $100,000 or even more, if he has credit with a trust company.

Mr. BRADLEY. The amount of bond for government work is double the amount of contract. What would the cost of such bond be?

Mr. SHIELDS. I have paid one-quarter of 1 per cent; but they are going to charge one-half per cent in future. In the municipal work in the city of Philadelphia the bond required is one-half the amount of the contract price, and the city also requires a contractor to give bond for the payment of his debts.

Mr. BRADLEY. Is it required that a bond be given indemnifying employees in case of injury?

Mr. SHIELDS. The city relieves itself of that in its contract.

Mr. BRADLEY. Is it customary for principals to require that bond be given indemnifying on account of claims for injury?

Mr. SHIELDS. Yes, it is done; and it is a prudent thing to do.

Mr. BRADLEY. Is the interest on them expensive?

Mr. SHIELDS. Yes; quite.

Mr. BRADLEY. What is the usual premium paid on a bond of this character?

Mr. SHIELDS. About one-quarter to one-half per cent of the amount of pay roll.

Mr. BRADLEY. That includes indemnification as to insuring employees or the public?

Mr. SHIELDS. The contractor is absolutely relieved of any responsibility whatever.

Mr. BRADLEY. Is the cost of excavation or laying of pipe or work of that character more expensive now than it was eight years ago?

Mr. SHIELDS. Under the present labor conditions and markets of iron, it would be no more expensive.

Mr. BRADLEY. Would $4 per foot for a double 8-inch line be a fair price for the work, or should we count on a lower rate?

Mr. SHIELDS. I rather think that at the time this work was done it was a little higher than it is to-day; I would safely say that instead of 1¼ it is 1⅛ now.

THE PENNSYLVANIA RAILROAD COMPANY,
Philadelphia, November 18, 1908.

Mr. V. J. BRADLEY,
Superintendent Post-Office Department,
Division of Railway Mail Service, New York City.

DEAR SIR: Your letter of the 10th instant to Mr. C. M. Shaeffer, S. P. T., regarding rates on iron pipe from Philadelphia, Pa., has been referred to this office for reply.

The present rates on cast or wrought iron pipe, in carloads, from Philadelphia, Pa., to Boston, Mass., 13½ cents; New York City, Pennsylvania Railroad, 9 cents; Chicago, Ill., 28 cents; and to St. Louis, Mo., 33 cents per 100 pounds.

Minimum carload weight on cast-iron pipe 30,000 pounds, and on wrought-iron pipe 36,000 pounds.

Yours, truly,

ROBT. C. WRIGHT,
General Freight Agent.

HEARINGS IN CHICAGO, OCTOBER 10, 1908.

Mr. BRADLEY. Congress at its last session included a clause in the post-office appropriation bill authorizing and directing the Postmaster-General to investigate and report to Congress as to the feasibility and desirability of the Government's purchasing or installing the equipment for pneumatic-tube service, and thereafter operating the same; also the approximate cost of purchasing or installation.

Q. Please state your name and office address.—A. William H. Lyman, 1409 Ashland block.

Q. State briefly your experience in making underground excavations and in general contracting which enables you to reply to questions on this subject.—A. We have taken underground construction for the Chicago Telephone Company, the Commonwealth Edison Company, and the city of Chicago, covering a period of eighteen years.

Mr. MASTEN:

Q. You made some figures on the laying of the pneumatic tube mentioned at the time they were arranging for the contract?—A. I did.

Q. To the Government?—A. Yes, sir.

Q. I presume in a general way the points in the city which are connected, or it is desired to connect by pneumatic tube, is understood; I will state them, however. The contract governing the pneumatic-tube service between the general post-office and the Union Depot, going by way of Custom-House place, Harrison street, Sherman street, up to the middle of the La Salle Street Station?—A. Yes, sir.

Q. And returning to Harrison street to the Edison tunnel under the Chicago River and along Canal street to the Union Depot; next line from the general post-office by Dearborn street, Monroe street, along the park on Michigan avenue to the old temporary post-office opposite Washington street, Michigan avenue to Randolph street, Randolph street to Dearborn, to the alley beween Randolph and Lake, then to La Salle, up La Salle, under the river through the old street railroad tunnel, and North Water street to the Northwestern Depot in the building at Kinzie and Orleans streets; a third line from the general post-office through Quincy street, State street, to Congress, Congress below Alley L to Twelfth street and into the Illinois Central Depot, near the old Express building, from there down Indiana avenue to Twenty-second street, on down Indiana avenue to Thirty-first street, through Thirty-first street to Alley L, down Alley L to Thirty-third and Dearborn streets, south to Root street, through Root to Halsted, and Halsted to the Stock Yards post-office at Forty-second street. The specifications for locating the pneumatic tubes are not prepared by the Post-Office Department, but the general description of the route is agreed upon, and the tube companies prepare their specifications so as to secure a very correctly laid double pipe, and usually lay them—in fact, must lay them—below the frost line, the depth depending somewhat upon the paving; if asphalt, not quite so deep as with macadam or wooden blocks. The tubes are about 10 inches outside, and are located side by side except past some obstruction, where they vary one above the other. The length of pipes are about 12 feet, and each joints must be yarned and sealed to make it tight, and have to be mandreled to

show a smooth joint for the passage of the carriers. With this general statement, would you state what difference there would be in the cost of laying pipes in the different streets that we have mentioned and in the different localities?—A. Well, I think perhaps you want an estimate on where you are going to lay them.

Q. It is a fact, and I think we might have stated it previously, that the Post-Office Department in making this investigation direct to the committee to ascertain the cost of installation and operation, as well as the cost of the present lines, and there being a contract for pneumatic-tube mail service already let which is not completed, there is still about 9 miles to be finished in Chicago, and it is possible that the investigation should ascertain the approximate cost of laying these 9 additional miles and in that way have some attractive interest for the contractor.—A. I would be willing to make an estimate and give you gentlemen my estimate of what the work would cost if I knew the location and had an opportunity of going over the territory. It differs greatly; you take the downtown district, for instance. There are so many through pipes, conduits, etc., in the ground that it has a great bearing upon the cost and also upon the character of the pavement. It is cheaper to do work in the cedar block pavement than the granite, brick, or asphalt pavement. Another point. The contractor guarantees the pavement of a street perhaps for two, five, and ten years in some cases and the city holds the contractor responsible for that street during that period. If I find that the street is under the control of some contractor who has given a bond and a guaranty to maintain the street for a number of years, then I would be obliged to go to that contractor and make terms with him. The city in some cases has inserted a clause whereby they are to charge so much where the street would be turned up by some outside contractor. In some cases they charge $5 a square yard; in some cases $3 for asphalt pavement.

Q. Is $3 about the usual charge?—A. Three dollars is now about the usual charge. That money must be paid to the contractor because he is to maintain that street for a number of years and the contractor of the tube would have to make arrangements that any new work that you might do might be considered in that connection—he would have to know what is would cost to do that work, as it might make a great deal of difference.

Mr. BRADLEY. How about the maximum and minimum estimates? Could not Mr. Lyman indicate what would be the maximum and minimum cost approximately of digging the trench, finding the general dimensions, etc.?—A. It varies so much. It must cost two or three times as much on one street as on another. The cost of digging the trench is not as important as the conditions under which you dig the trench.

Mr. MASTEN. The additional tube lines that are under contract will extend from the limits of the present lines, one extending along Madison street from the union depot to Center avenue, and Station D at or near Hoyne avenue, south from there along to what we call Douglas Park post-office, about Twelfth and Western avenue. Another line from the union depot down Canal street and along Blue Island avenue and Pilsen post-office. The third line from Station C, from Center avenue north near the Carpenter street post-office.—A. It would be impossible for a new contractor to make an intelligent estimate of the cost of the work without going over the ground and knowing just what you want. I would have to go over the ground and find out what is wanted. You can do work for one-third or one-fourth as much on one street as on another.

Q. Madison street is asphalt pavement, and the districts named would be about the highest, or maximum?—A. Madison street would be a costly street because there are so many pipes there now. Madison street is a street that is a main artery. It has been used by telephone companies, the Edison Company, and every other company.

Mr. NORRIS. Do you strike much rock in excavations in Chicago?—A. Very little. Take the district on Western near Chicago avenue and you will strike rock almost on the surface. There is a district around South Halsted and Twenty-sixth streets where you strike rock within 5 or 6 feet of the surface.

Mr. MASTEN. How much difference would the cost be to follow the alleyway between Madison and Washington streets on the West Side, say from Center street as far as Western avenue?—A. It would reduce the cost perhaps one-third; that is, outside the cost of the pipe; I mean actual work connected with

it; outside the original cost it could be reduced about one-third by taking the alley.

Q. Could the Post-Office Department make specifications that call for proposals to excavate by the cubic yard and get a price separately?—A. I think so; that would be fair.

Q. Pipe laying separate?—A. I guess so.

Q. What would be the maximum and minimum cost of trench work to the depth of 4½ feet?—A. I can't answer that question just now without looking over such notes as possible. It would be fair to bid that way—to bid where it is asphalt—so much a cubic yard or foot, cedar block and granite block, and where there is no pavement.

Q. A contractor can make the price of, say, $3 a square yard for resurfacing asphalt; with Belgian block, $2.50, etc.—A. Yes, sir. If you wanted to bid, a contractor could give you so much a cubic yard or foot, including the pavement. It would be a simple proposition to go over the ground and find out the conditions. I would look over the piece of work and figure so much a cubic foot and so much a cubic yard. I would take my chances on that and figure that. I would excavate, including all permanent pavement, regardless of obstructions, etc. I would do that work complete, permanent paving and all. Very often corporations let the work to one contractor who does all the underground work, and then they have another contractor to do the paving, but the best way to do it would be to call for bids for estimates, so much a cubic yard, including all the cost.

Mr. BRADLEY. Do you think, Mr. Lyman, that it would be preferable for a contract to be made which would include not merely the trench work and the relaying of the pavement, but also the laying of the pipe and the maintenance of the entire tube line, including repaving, as against any irregularities or defects in the construction of the line, but not as against any irregularities arising from the operation of the line?

A. I think that would be the best way to have the work, for various reasons. You might have one contractor who might take the contract to lay the tube and another to do the work of excavating and another contractor to do the paving. There would be question as to the responsibility in this case. If you held one contractor to all of the construction, and held him responsible for the construction of the work, it would be more satisfactory, to my mind, than to have two or three contractors. In this case one will place the blame on the other, and so the contractor for the excavations will say he did his work right, the contractor for the pavement will say it was not placed right, etc. If there should be a settlement of the pavement, I might want you to repave it. If you had one contractor do the entire work, you can hold him responsible.

Q. Congress, in directing this inquiry, has made no special appropriation for the purpose, and we therefore have not the opportunity of employing experts or to reimburse witnesses for any time they devote to this subject.—A. Notwithstanding that, I will be very glad to prepare an estimate in the course of a few days showing the varying average price per linear foot for work of this character and send it to you.

Mr. MASTEN. To what extent is the contracting now followed on the basis of cost and a percentage to the contractor?

A. Ninety per cent of the work done is done by actual bidding without percentage.

Q. What is the usual bond—what percentage of the contract is the usual bond given for to guarantee the performance of the construction work on the part of the contractor?—A. The bond is about one-half of the amount of the contract, and the cost of the bond from the surety company is about 1 per cent of the bond based on the amount of the bond, and a surety-company bond is always required.

Mr. LYMAN. Another requirement of the contractor now is an accident policy protecting the workmen engaged in the work and another policy protecting the public against damages or accidents arising from the work on the streets. The cost of these bonds is based on the amount of the pay roll. The premium on the employee's-liability bond is about 4 per cent of the pay roll, and the premium on the bond protecting the public is 2 per cent of the pay roll. The protection to the contractor under either of these bonds is a maximum of $10,000 in any one accident or death.

OFFICE OF JAMES LYMAN & CO.,
Chicago, October 15, 1908.

JOSEPH STEWART, Esq.,
Second Assistant Postmaster-General,
Washington, D. C.

HONORABLE SIR: In accordance with an agreement made with Mr. Bradley, Mr. Norris, and Mr. Masten, members of the commission on pneumatic-tube service, we hereby submit to your honorable commission an estimate for installing a pneumatic-tube system in Chicago.

Our figures include the furnishing and laying of two pneumatic tubes and excavations for same, the removal of all surplus material, and the permanent repaving of the trench, for the following prices:

Asphalt pavement, per trench foot, complete	$5.25
Granite pavement, per trench foot, complete	5.00
Brick pavement, per trench foot, complete	5.00
Macadam pavement, per trench foot, complete	4.35
Cedar block pavement, per trench foot, complete	4.35
Unimproved streets, per trench foot, complete	4.00

Very respectfully,

JAMES LYMAN & CO.

HEARINGS AT ST. LOUIS, MO., OCTOBER 12, 1908.

Mr. Bradley and Mr. Masten present as representing the subcommittee and Mr. R. S. Colnon, general contractor, 615 Merchants-Laclede Building, as voluntary witness.

Mr. Bradley read the law directing the inquiry and explained the lack of appropriation or opportunities for reimbursing experts or witnesses.

Mr. BRADLEY. Will Mr. Colnon state in a few words the experience he has had in this line of business that enables him to speak advisedly.

ANSWER. I am an engineer and have contracting mostly in city work in St. Louis for about fifteen years now. I have never laid any pneumatic tubes, but have done similar underground work in the shape of conduits for telephones and electric-wire-using companies and water pipe and gas pipe.

Mr. MASTEN. At the present time the pneumatic-tube mail service in operation in St. Louis consists of two lines of 8-inch tube, extending one to the union station from the main office and the other to what we know as Bridge Station, a postal station at the western end of Eads Bridge, and supplying the financial and banking district on Third street, north and south from that point. These tubes are laid, the first one through Ninth street and Pine, Ninth up Market and Nineteenth to about the center line of the union-depot shed, and then across the shed and into the postal station on Eighteenth street, almost opposite Clark. The other line extends from the main office through Ninth street to Washington avenue and down Washington avenue to the bridge entrance to the branch post-office located alongside the bridge. The tube lines are constructed of iron pipe, and the interior is bored out so as to get an absolutely smooth interior. The carriers containing the mail are made of steel, about 30 inches in length, and have bearing bands at each end, or near the end, that fit the interior of the tube smoothly. They are moved by air pressure from a pumping plant situated in the post-office building, in the basement. It is necessary, in order to get these long cartridges, you may call them, through, and at a fast rate of speed, to have the line laid very perfectly, very correctly, and about 4½ feet, or a depth sufficient to get below the frost line. The trench must be wide enough to permit the two tubes to be laid alongside, in order to get the best foundation for them, and the clearing of obstructions is rather a difficult one, but by the use of a reducer length of pipe they are able to avoid obstructions and still not allow a kink to remain in the line and prevent the passage of carriers. Otherwise the street work, the trench, paving, and all that, is similar to other pipe construction.

In your opinion, would a trench of, say, 2 feet or 26 inches in width and 4½ feet in depth over the route just described vary much in cost over any part of it?

ANSWER. No; I should say not. I should say that that would not be a difficult location to lay that kind of pipe.

Mr. MASTEN. At the depth described?

ANSWER. Yes, sir.

Mr. MASTEN. And that the cost of trench work and paving would not vary much?

ANSWER. It would not vary much. I think that section is all paved, or most of it paved, with granite.

Mr. BRADLEY. What would be a fair cost for relaying granite pavement, Mr. Colnon?

ANSWER. Well, I should say on a trench of that kind, replacing the concrete and the pavement, it would be worth perhaps $12 to $13 a square; that is, 12 or 13 cents a square foot.

Mr. BRADLEY. That would be about $1.17 a square yard?

ANSWER. Yes; $1.17 per yard—that is, using the old blocks, of course—using the material that is available.

Mr. MASTEN. Does contracting in St. Louis follow the plan of repaving or cost of trench work in one sum, or is it usual to obtain bids for separate work?

ANSWER. Well, the work that I have done for the Bell Telephone Company, for instance, we had unit prices for everything—for concrete, linear foot; of conduit, per yard; of excavation, per square, of various kinds of pavements, so that it was separated very minutely. There is a thing that would enter into that now. The new pavements that are put down in St. Louis, most of them, are granite, and there is a clause in most of the contracts which allows the layer of the pavement to replace any pavement taken up by the city or by anybody permitted to take it up at their price at which the pavement was laid; so, of course, the price would be fixed by the price at which they had laid the pavement for the city.

Mr. MASTEN. The excavation work, then, for the trenches in this soil is held at about what rate per cubic yard?

ANSWER. Well, that would depend, of course, upon the disposal of the surplus—of how much surplus you had to dispose of. The excavation, I suppose, upon a trench would be worth about 60 to 75 cents a cubic yard; then the disposal of it would cost something additional, depending upon the location—probably $1 a yard for the actual hauling.

Mr. MASTEN. Sixty or 70 cents for the actual work of excavation and refilling, and $1 a yard for the removing of the surplus earth?

ANSWER. Yes.

Mr. BRADLEY. Are there any cases where the disposal could be made profitable, so as to cover the cost of excavation?

ANSWER. Not in any downtown district.

Mr. BRADLEY. Do you strike any rock in St. Louis?

ANSWER. There are places where you strike rock at 4 or 5 feet in depth. In the downtown district, when you get down next to the river, you might strike rock, but between here and the union station you would hardly strike any of it.

Mr. BRADLEY. Even if you strike rock, I suppose it is almost a negligible factor?

ANSWER. There would be very little of it. In the water department they usually specify an allowance of $2 to $2.50 per yard for any rock you may strike.

Mr. MASTEN. Then it is not easily removed?

ANSWER. It has to be blasted.

Mr. MASTEN. What experience have you had, or could you give an estimate of the cost of laying the pipe, such as I described, with the iron and leaded joints bell and spigot joint?

ANSWER. Are the pipes laid on foundation?

Mr. MASTEN. Practically only at the joint.

ANSWER. Not laid in concrete?

Mr. MASTEN. The bends where they are deflected from one street to another, or points where accidents are liable to happen, and in especially difficult places, they brick in a vault, and at other times only have a manhole to reach the joints.

ANSWER. I don't see anything to make that very expensive. It would cost something more than either gas or water pipe, but I would not think that it would very greatly increase the cost.

Mr. MASTEN. Would 30 cents a foot be a fair price?

ANSWER. I should think that would cover it.

Mr. MASTEN. Would these vaults at the street intersections where the pipes bend from one street to another be termed additional cost?

ANSWER. Yes, sir.

Mr. MASTEN. They would be laid separately?

ANSWER. I would not say laid separately, but specified differently. I think that would be the most satisfactory way; by unit prices of all the work and by cubic foot of space. I should say cubic foot of masonry, or whatever material is used—brick or masonry.

Mr. MASTEN. I can see that the excavation and the removal of the dirt would be taken case of in the items we have already gone over, and the remaining item is to get the amount of masonry work involved?

ANSWER. Yes, sir.

Mr. BRADLEY. Would that be estimated on the cubic yard?

ANSWER. Cubic yard or cubic foot.

Mr. MASTEN. Mr. Colnon, if the vault work necessary to be done on the streets can be of brick without a specially expensive foundation, and a 9-inch wall, and of about 3 feet in width, what would be a reasonable charge for such work?

ANSWER. I should say that you could figure that kind of brickwork at the rate of, say $16 a thousand brick, wall measure.

Mr. BRADLEY. Do you consider that it would be preferable, from the government standpoint, to deal with only one contractor for the entire work of excavation, pipelaying, relaying of pavement, and subsequent repair work?

ANSWER. I would consider that the only practicable way to let a contract.

Mr. MASTEN. Have you installed much machinery in buildings?

ANSWER. No; I have not had much experience in that line.

Mr. MASTEN. You are not familiar with the prices or with the cost?

ANSWER. No; I could not give you very definite information on that.

Mr. BRADLEY. As I understand it, the contractor who takes the contract for the entire new paving of streets, the custom is now to recognize him as a preferred contractor for future work?

ANSWER. Yes; he makes the repairs. In other words, he possesses that right according to his contract with the city, and the individual contractor in doing work must deal with the standing contractor. There is a prescribed rate. For instance, if you cross a street that is under maintenance, you can do the back filling and everything preparatory to the replacement of the top pavement, and that is allowed to settle for six months; then when the city says it is time to be repaved, they notify the contractor who has the contract to replace the pavement.

Mr. MASTEN. For what term does this guaranty run?

ANSWER. From five to ten years.

Mr. MASTEN. Is there any rule against opening a newly paved street within a year's time or any given time?

ANSWER. Nothing except by permission of the board of public improvements. They may grant permission at any time.

Mr. MASTEN. I think you stated, Mr. Colnon, that in submitting a bid for work for the companies that you have been dealing with, that they execute a bond for the faithful carrying out of the contract?

ANSWER. Yes, sir.

Mr. MASTEN. For a stipulated sum?

ANSWER. The city requires a certain percentage of the contract price.

Mr. BRADLEY. What percentage?

ANSWER. The bond is figured—I would not be sure—but it is figured by a certain percentage on a small amount, and a decreased percentage on the remaining, so that it is not a fixed percentage on the contract.

Mr. BRADLEY. Would it be approximately 50 per cent?

ANSWER. I think on ordinary contracts it would amount to about 30 per cent.

Mr. BRADLEY. What would be the premium on the bond?

ANSWER. The premium is fixed by the surety company on the entire contract price, irrespective of the amount of bond required by the city regulation, and at present that is one-half of 1 per cent.

Mr. BRADLEY. Are you obliged, Mr. Conlon, as a general contractor, to give bonds against liability while the work is in progress?

ANSWER. No; I never have. Well, of course, it is included in the contract always, but the person for whom you are doing the work is protected against any accident that may occur while you are doing that work; but there is no separate bond for that.

Mr. MASTEN. Or an insurance?

ANSWER. I might carry liability insurance, but as a contractor that would be optional with me.

Mr. MASTEN. Is the premium on that insurance very heavy?

ANSWER. I suppose that on that kind of work it would amount to probably about 2 per cent on the amount of the pay roll.

Mr. BRADLEY. Would that be as against injuries to employees and to the public both?

ANSWER. Yes.

Mr. BRADLEY. Is it customary for parties giving out work to include in the contract a provision for indemnity such as this; that is, that the contractor is to protect his employer against claims of this kind?

ANSWER. They do sometimes.

Mr. BRADLEY. It would probably be wise for the General Government to specify such indemnity?

ANSWER. I should think so. I think, as a general proposition, that a contract of that kind should include everything. That would be the only suggestion that I could make, and to make the terms as elastic as possible; that is, to apply to the different conditions that you might meet, rather than to make a lump-sum contract with all of the chances taken by the contractor.

Mr. MASTEN. Would that produce a better contract price?

ANSWER. I think so. I think that you could work for less money under that system; and while the contractor would not always make as much, he would not lose as much.

AMERICAN EMBASSY,
Vienna, March 24, 1908.

The Honorable ELIHU ROOT,
Secretary of State, Washington, D. C.

SIR: I have the honor to transmit to you herewith a copy of a report which I made, at the request of the Hon. George von Lengerke Meyer, Postmaster-General, on the pneumatic-tube system of the city of Berlin, which report was made during the time between the taking of my oath as second secretary of embassy at Vienna and my entry on the duties of that post on the 31st of May, 1908.

I have the honor to be, sir, your obedient servant,

NELSON O'SHAUGHNESSY,
Second Secretary of Embassy.

To the Honorable GEORGE VON LENGERKE MEYER,
Postmaster-General, Washington, D. C.

SIR: I have the honor to submit to you herewith a report on the pneumatic-tube system in use in Berlin for the transmission, within urban limits, of mail matter under a certain size and bearing a special postage.

This system, which in Berlin is commonly called the "rohrpost," was introduced in the year 1876, and was originally only intended for the transmission of telegrams from certain substations to the central telegraph office, which was then, as it is now, the center of the whole system. It was soon, however, opened to the public, and has enjoyed a constant development and success ever since. Its development has kept pace with the growth of the city, until now there are over 70 receiving and delivery stations within the metropolitan area.

There are similar systems in Paris, "le petit bleu," in Vienna, in Frankfort on the Main, and in Hamburg, but in the two latter cities it is not open to the public.

As I have said above, the "rohrpost" was first used to send telegrams from the smaller stations to the central telegraphic office, for thirty years ago telegraphic instruments were very costly, less efficient, and the expert labor necessary to operate them most expensive; but the imperial post authorities have now decided to do almost all telegraphic business by telegraphy, for the instruments are now more simple and the labor required less highly paid.

The Berlin "rohrpost" is based on a system of radiation—that is, starting from the central telegraph office, a series of tubes go to the nearer and more important posts and telegraph offices, and from these again others run to stations in their vicinity. There are also a few lines, as will be seen from the inclosed plan, which are quite separate from the lines which radiate from the central telgraph office.

These lines run between two very important points, as the "lehrter" and "anhalter" stations, and there are only two such lines in operation. In other

cases when a letter is to be sent from one side of Berlin to the other it must go through a series of tubes and finally reach the central telegraph office, whence it is sent off to the other side of the city. There are also a few lines which run directly from the central telegraph office to other very important points, such as to the Reichstag.

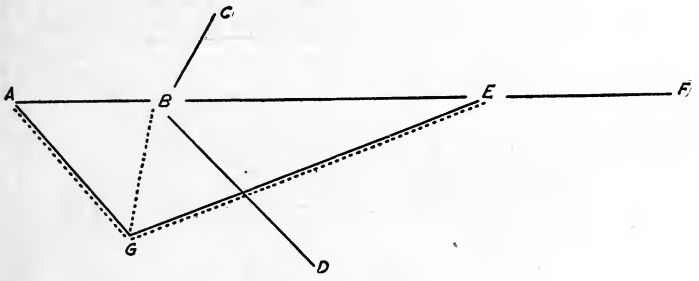
All stations are connected with one another by one tube (in a few cases by two tubes), and this tube serves for the transmission of mail matter in both directions, as will be presently explained.

A dual system of propulsion is used; that is, the projectile containing the letter or card is shot in one direction by means of compressed air, and the same projectile is then returned to its home station by means of rarefied air—that is, by suction. The compressed air is 1 atmosphere above the normal pressure, and the rarefied air is 1 atmosphere below the normal.

There are 7 (now being increased) power-generating stations, which are quite separate from the stations which receive and deliver "rohrpost" mail matter, and 70 (now a few more) stations which handle "rohrpost" mail matter. These stations are supplied with the necessary pneumatic power from the power-generating stations, which are situated in convenient parts of the city, in iron pipes varying from 150 to 300 millimeters in internal diameter. There are 82 kilometers of such pipes. Each generating station has 2 air pumps of 50 horsepower each, each one of which is capable of supplying 350 cubic meters of air compressed to a density of 1 atmosphere above the normal and 350 of air reduced to one-half atmosphere below the normal per hour. The total horsepower of the 7 stations is about 1,400.

The longest run between any two stations is 3,000 kilometers, and the official time for accomplishing this distance is four minutes ten seconds with compressed air and five minutes and thirty seconds with rarefied air. The highest velocities are attained in the shorter runs, where a maximum speed of 20 meters with compressed air and 16 meters with rarefied air is reached; the shorter the run between the stations the greater the speed.

To better illustrate the system of stations and dual propulsion, I present the following plan:



..... *Pipes from the generating stations.*

——— *Pneumatic tubes for transmission of mail matter.*

In the above plan A, B, C, D, E, F are stations equipped with receiving and forwarding instruments for the transmission of mail by "rohrpost," of which A, B, and E are supplied with pneumatic power from generating station G.

Supposing a letter is to be sent from A to C, it is first sent to B, where it is removed from the tube which brought it from A and put in the tube which runs to C; both the tubes running from A to B and from B to C are operated by compressed air. On the other hand, if a letter is to be sent from C to A, the same route would be followed, but the transmission would be accomplished by means of rarefied air—that is, the projectile containing the letter would be sucked back from C to B and again from B to A; the same applies to E and F. There is a telegraphic signal between all the stations.

The total length of pneumatic tubing in use at the end of 1906 was 125 kilometers. This, of course, does not include the piping for the transmission of air from the generating stations, of which there are 82 kilometers.

One of the longest distances one can send a letter is from the central telegraph office to one of the stations in Charlottenburg, a distance of 9 kilometers, during which journey the letter would have to be transferred from one set of tubes to another at six intervening stations. The official running time for this distance, not including the time consumed in transferring from one set of tubes to another, is nine minutes when the journey is performed by compressed air; the time taken to transfer the letter from one set of tubes to the other is very small. The projectiles containing the mail matter are sent through the tubes at definite times—that is, every two, three, five, etc., minutes, according to the prescribed regulations, and they thus make connection at the various stations and a minimum of time is lost in transferring. I am inclosing herewith a copy of the "Rohrpostordnung und Rohrpostbetreibsordnung, für Berlin" for the year 1903, in which much of the working of the system is set forth.

I am inclosing an illustration of one of the projectiles used for the sending of letters, etc., its outward diameter is a little under 65 millimeters, which is the internal diameter of the transmission tubes; they are made of aluminum and leather.

The letters and cards sent by the "rohrpost" are delivered on their arrival at their destination by the same messengers who deliver telegrams, and who are all mounted on bicycles.

The price for a post card is 25 pfennigs, for a letter 30 pfennigs, and for a reply-paid post card 50 pfennigs; the post sells special "rohrpost" cards and envelopes, but any card or envelope not above a certain size is received for transmission if fully paid, the size is only limited by the capacity of the projectile it has to be carried in; in the inclosed book can be found those articles which are forbidden to be forwarded by "rohrpost." There is no special collection for the "rohrpost" in the city of Berlin, as there is in Vienna, but it is collected like ordinary post; in the stations, however, are special boxes for such mail matter. I have had much occasion to make use of the "rohrpost" in Berlin, and I am able to testify to its efficiency; I have on several occasions received an answer back within an hour and a half. This system was established in Berlin with a minimum of expense, as Berlin is built on sand, and the tubes are simply laid 1 meter under the sidewalks, where they are easily get-at-able; then also the Prussian State has certain accepted rights of way in the municipalities, and there has been therefore no conflict of rights; thus the State had to buy nothing.

The main things which result in trouble in the working of this system are the internal rusting of the tubes, excavations, water in the tubes, and the formation of frost and ice in the tubes; all of which evils have now been quite satisfactorily overcome.

The apparatus in general are of very simple and durable construction, and many of the machines which were installed thirty years ago are yet in operation; and as the pressure needed is not high, the horsepower required is not great. I give a synopsis of the expense of operating the power stations for the year 1901. This is official; it is the latest information I can get.

Items.	1900.	1901.
	Marks.	*Marks.*
Fuel	51,150	65,850
Municipal water taxes	3,800	3,800
Lighting	1,700	1,700
Oil, waste	7,350	7,350
Printing, paper	1,900	1,900
Repairs to machinery	8,400	8,400
Transit for mechanics	700	700
Wages of mechanics	56,311	56,311
Total	131,311	146,011

Unfortunately these figures only refer to the upkeep of the generating stations; the expense connected with repairing the tubes is not given, but I am of the opinion that the same is an appreciable item in the expenses.

I have experienced much difficulty in getting any definite statement concerning the working expenses and general financial condition of the "rohrpost," as

the yearly statement is not in detail, but merely states that the system has brought in so and so much. I have been verbally informed by the postrat, who was detailed to give me information, that the capital up to the present invested in the "rohrpost" is 5,500,000 marks, and that during the financial year 1906 it contributed 1,100,000 marks to the revenues of the imperial posts. During the year 1906 the sum of 70,000 marks was written off for wear and tear, but I do not know whether that had been deducted from the estimate as above given for the year. The above estimate of 1,100,000 marks is not based upon purely postal business done by the system, as I shall show. As has been already explained, the original idea of the "rohrpost" was to send telegrams from the smaller offices to the central telegraph office, and in making the yearly statement of accounts it is the custom to credit the "rohrpost" in some cases with the total amount thus received for the transmission of telegrams, and in others only with a part of the amount thus received.

In the statement for the year 1906 the sum of 550,000 marks is credited to the "rohrpost" for the transmission of telegrams, which is just one-half of the amount brought in by it for that year, or, rather, 550,000 marks have been arbitrarily credited to it.

The "rohrpost" has almost abolished urban telegrams, as a telegram costs 50 pfennigs for 10 words and 5 pfennigs for each additional word, and unless sent "urgent," with a treble toll, they are very little faster than a "rohrpost" letter.

Among other things which have been ministered to its popularity besides its cheapness and speed may be mentioned the great caution of the German tradesman, who prefers to see an order, for instance, accompanied by the signature of the man who orders; thus all stock-exchange business, or at least a great deal of it, is done by "rohrpost," and a special line runs from the central telegraph office to the Bourse. The laws also which relate to the use of telegrams as evidence in court have helped to bring it in favor with business men. In the case of a telegram certain tedious formalities have to be gone through.

I am inclosing herewith a plan of the "rohrpost" system of Berlin as it appeared at the end of 1901, and also an illustration of the projectile in which the mail matter is inclosed for transmission through the tubes.

I have much mechanical and technical detail at my command, which I have purposely not incorporated in this report, but which I can at a moment's notice place at your disposal, if you so desire. I have also the names and addresses of the firms which have installed the system in Berlin, and I shall send you the approaching publication on the "rohrpost," which will shortly be issued by the Kaiserliche postamt in Berlin.

I have the honor to be, sir, your obedient servant,

NELSON O'SHAUGHNESSY,
Second Secretary of Embassy.

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
DIVISION OF FOREIGN MAILS,
Washington, D. C., September 18, 1908.

SIR: Referring to your letter of the 22d ultimo, I transcribe, for your information, the following extract from a letter of the Canada office, dated the 12th instant, viz:

"With reference to your communication of the 26th ultimo. requesting information respecting the installation and operation of pneumatic tubes in the postal service of Canada, I beg to say that there are no pneumatic tubes operated in connection with the postal service of this country."

Very respectfully,

BASIL MILES,
Superintendent Division of Foreign Mails.

The SUPERINTENDENT DIVISION OF RAILWAY ADJUSTMENTS,

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
DIVISION OF FOREIGN MAILS,
Washington, D. C., September 25, 1908.

SIR: With further reference to your letter of the 22d ultimo, I transcribe, for your information, the following extract (translation) from a letter of the postal administration of Germany, dated the 10th instant, together with the copy of the Deutsche Verkehrs Zeitung therein mentioned:

"In reply to your letter of the 26th ultimo, I have the honor to inform you that the pneumatic mail tubes in use in this administration are in general employed only for forwarding telegrams between the main post-office and its branches in the same city. The only exception is the pneumatic-mail-tube service in Berlin, which is employed to forward, in addition to telegrams destined for delivery within the city limits and some of its suburbs, special-delivery letters and postal cards (pneumatic-tube letters and post cards). Other articles of mail, and especially ordinary letter mail, are not forwarded even in Berlin by means of pneumatic-mail-tube service.

"A description of the pneumatic-mail-tube service was transmitted to your administration with letter of December 29, 1890.

"I may add that there is now under consideration a project for the construction of a tunnel and electric-railway service for the transportation of all kinds of mail matter between the principal post-office stations and the Potsdam Railway depot in Berlin. The Siemens-Schuckert Werke (Berlin S. W. 11, No. 3 Askanischer Platz 3) have constructed an experimental section of the tunnel railway on their factory grounds, in regard to which there is an article in the inclosed No. 22 of the Deutsche Verkehrs Zeitung.

"Should it be desired by the Post-Office Department, I shall gladly furnish further information on the subject later on."

Very respectfully,

R. L. MADDOX,
Acting Superintendent Division of Foreign Mails.

The SUPERINTENDENT DIVISION OF RAILWAY ADJUSTMENTS.

POSTAL RAILWAY IN BERLIN—AN UNDERGROUND ELECTRIC ROAD OF SMALL PROPORTIONS FOR MAIL BAGS.

A dispatch from Berlin to the London Times states that the German post-office department has put forward a scheme to connect the general post-office in that city with the various branch offices by the construction of an underground railway, by means of which the more rapid distribution of the mail bags to and from the mail trains will be effected at a speed of about 25 miles an hour. The railway will be worked without a guard or driver, and the tunnel, which will be placed close beneath the road surface, is to be only 29 inches in height by 71 inches in width. Each truck or car is intended for the conveyance of a large-sized mail bag. The complete train will be composed of a dwarf electric locomotive and not more than four trucks. The locomotive will have a pair of axles, each furnished with a motor. The line will be double track throughout, constructed on a 16.13-inch gauge. Over each track will be conductor rails. A trench will be provided between the two lines of rails, so that a man will be able to pass through the tunnel. The railway is to be operated by electricity. The construction of these tunnels for distribution of mails, the dispatch says, is regarded as a matter of certainty, as the negotiations between the postal authorities and city of Berlin have already been concluded.—*Daily Consular and Trade Reports, No. 3170.*

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
DIVISION OF FOREIGN MAILS,
Washington, October 3, 1908.

SIR: With further reference to your letter of the 22d of August last, I transcribe, for your information, the following extract from a letter of the postal administration of Great Britain, dated the 22d ultimo, viz:

"With reference to your letter of the 26th of August, 1908, concerning the use of pneumatic tubes for the transmission of mails, I am directed by the


Fourneaux
102
69
Vouille

postmaster-general to inform you that no pneumatic tubes have yet been installed in connection with the mail service in this country.

"The question of adopting the system to connect the various district offices in London is at present under consideration, but no decision has yet been arrived at."

Very respectfully,

R. L. MADDOX,
Acting Superintendent Division of Foreign Mails.

HON. JOSEPH STEWART,
Second Assistant Postmaster-General.

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
DIVISION OF FOREIGN MAILS,
Washington, D. C., October 24, 1908.

SIR: With further reference to your letter of the 22d of August last, I transcribe, for your information, the following extract (translation) from a letter of the postal administration of Italy dated the —— instant, viz:

"In reply to your letter of the 26th of August, 1908, I have the honor to state that this administration is about to install a pneumatic-tube service in Naples, Milan, and Rome, between the central post-offices and the railroad stations of said cities, which is intended to be used exclusively for transportation of special-delivery letters and telegrams, as is done by the pneumatic-tube service of Vienna, Berlin, and Paris. The size of the tube which will be adopted has a diameter of only 80 millimeters ($3\frac{3}{20}$ inches).

"The transportation of all the voluminous mails between the central post-offices and the railroad stations will continue to be performed by means of horse-drawn wagons or automobile mail wagons.

"It is impossible to state the cost of installation, as the service has not yet been installed."

Very respectfully,

R. L. MADDOX,
Acting Superintendent Division of Foreign Mails.

HON. JOSEPH STEWART,
Second Assistant Postmaster-General.

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
DIVISION OF FOREIGN MAILS,
Washington, D. C., November 3, 1908.

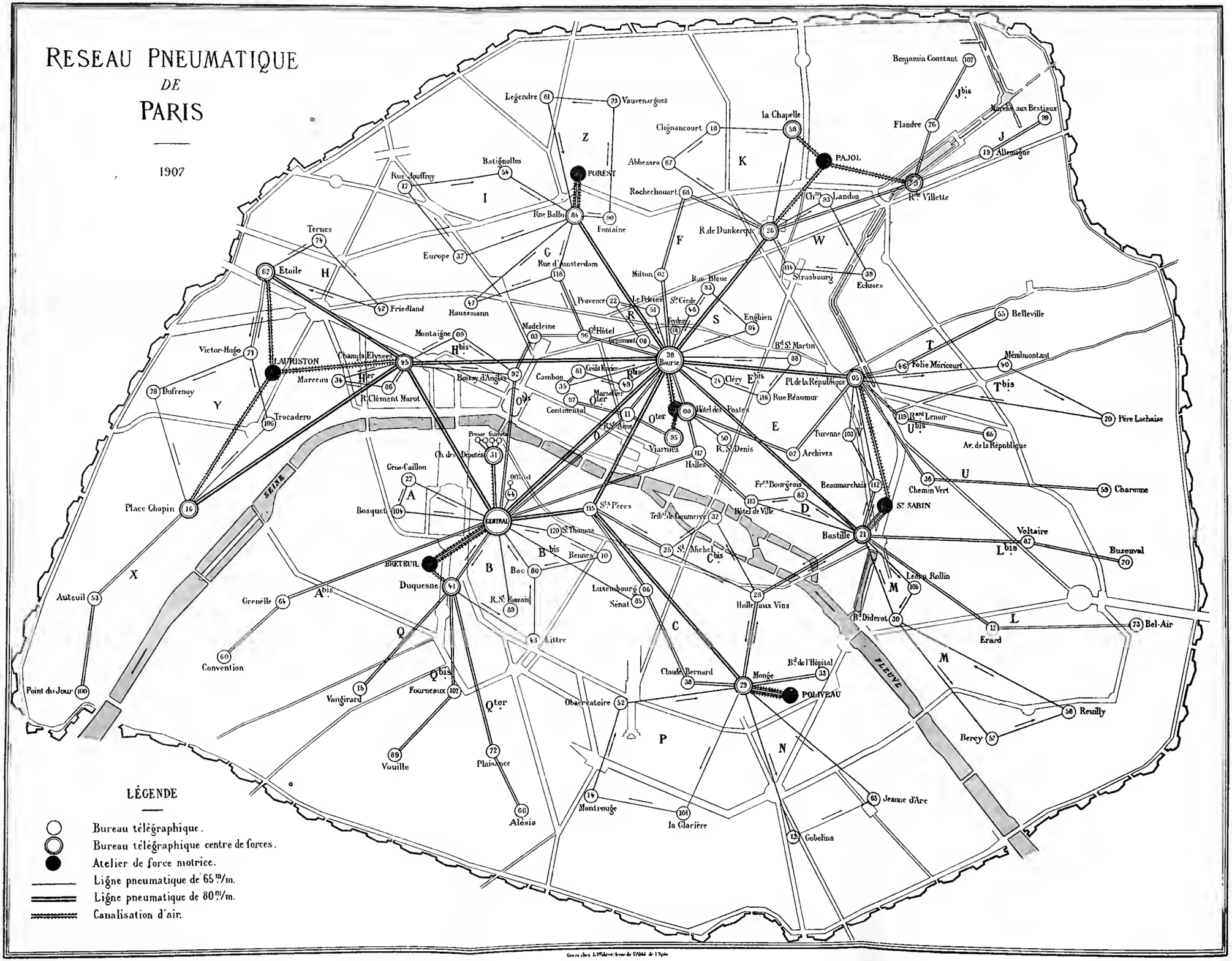
SIR: With further reference to your letter of the 22d of August last, I transcribe for your information the following extract (translation) from a letter of the French office dated the 19th ultimo, viz:

"Up to the present time pneumatic tubes have not been used in France for the transportation of mail in bulk. This administration uses only pneumatic tubes of small diameters, 65 and 85 millimeters, respectively (2.56 and 3.15 inches), for the telegraph service, which are constructed and installed as indicated in the accompanying memorandum and in the pamphlet of instructions, also inclosed.

"There are in France three pneumatic-tube systems—at Paris, Lyons, and Marseille, respectively. The installation at Paris is the only important one. By means of it the branch post-offices of this city are placed in direct or indirect communication with the great central offices of the "bourse" and "poste centrale telegraphique," as shown on the diagram herewith. It is used to transport within the limits of Paris:

"1. Telegrams originating in or destined for delivery in Paris (except telegrams received in Paris and suburbs which are also destined for delivery there; these are transmitted telegraphically).

"2. Articles called 'pneumatic correspondence' originating in Paris and for delivery in Paris or in a few neighboring towns, for which the following charges are made: Thirty centimes, up to 7 grams (6 cents, up to one-fourth ounce, avoirdupois; 50 centimes for 7 to 15 grammes (10 cents for weights between one-fourth and one-half ounce, about); 1 franc for 15 to 30 grams, maximum weight ($0.193 for weights between one-half and 1 ounce, about).



LÉGENDE

- Bureau télégraphique.
- Bureau télégraphique centre de forces.
- Atelier de force motrice.
- Ligne pneumatique de 65 m/m.
- Ligne pneumatique de 80 m/m.
- Canalisation d'air.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS WASHINGTON D. C.

House Doc. No. 1220, 60th Cong., 2d Sess.

"The number of telegrams transported annually in the interior of Paris by means of the tubes is between 11,000,000 and 12,000,000.

"In 1907 the number of articles of pneumatic correspondence was 9,069,285 and the proceeds therefrom amounted to 2,746,350 francs ($530,045).

"The cost of installation and the operating expenses are as follows:

"(*a*) Original cost of installation: (1) Power-house plant, about 2,100,000 francs ($405,300); (2) trenches, tubing, and apparatus, 3,200,000 francs ($617,600); total, 5,300,000 francs ($1,022,900).

"(*b*) Annual expense of operation: (1) Technical force (civil engineer, inspectors, managers, dispatchers, draftsmen, chief mechanics, and workmen, 300,000 francs ($57,900); (2) operating force (employees working the apparatus at stations), 409 'tubistes,' at 2,000 francs ($386); on an average, 818,000 francs ($157,874); (3) delivery expenses and cost of selling (undeliverable) 'pneumatic correspondence' (about 10 centimes per article), about 907,000 francs ($175,051); (4) rent and maintenance of workshops, expense of coal, grease, oil, illumination, and repairs of apparatus and carriers, about 450,000 francs ($86,850); total annual operating expenses, 2,475,000 francs ($477,675)."

All the documents referred to in the foregoing extract are herewith inclosed.

Very respectfully,

R. L. MADDOX,
Acting Superintendent Division of Foreign Mails.

INSTALLATION OF PNEUMATIC TUBES.

Size and form of tubes.—The tubes used for the transportation of telegrams are 80 millimeters (3.15 inches) and 65 millimeters (2.65 inches) interior diameter. They are made of malleable iron with soldered seams (brazed ?). The exterior diameter is 87½ millimeters for the former and 72½ millimeters for the latter (3.44 and 2.85 inches, respectively.)

They must be very carefully laminated, present a uniform surface on the interior, and be capable of being bent cold by machine without scaling, cracking, or buckling.

The tubes are in lengths of 5 meters (16 feet, about), delivered polished on the interior and with wooden plugs at either end.

Least radius of curves.—The radius of the cures is 1.5 meters (59 inches). In exceptional cases this radius may be reduced to 1.2 meters (47¼ inches).

Heaviest grade and pressure.—No particular limitation to the grade. The tubes enter the post-offices vertically.

Pressure is variable, but never exceeds 1 kilogram.

Precautions for preservation of the joints.—No particular precautions are adopted. The tubes are given a coating of coal tar by the employees after delivery.

The joints have the form shown in drawing. A rubber or greased leather washer inserted between the two guides secures an air-tight joint.

Least depth of the cuts.—In Paris almost the entire system is installed in the sewers.

In cuts the tubes generally are placed at a depth of 1 meter. No especial precautions are taken for their preservation, but in very bad ground it might be well to set them in cement, but in such a way that the tubes are accessible, say, every 40 meters (131 feet, about).

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF MANUFACTURES,
Washington, November 18, 1908.

DEAR SIR: Again referring to your letter of the 11th instant requesting information concerning mileage of pneumatic tubes in France, I have pleasure in informing you that this bureau has just received a cablegram through the Department of State from the consul-general at Paris, which reads as follows:

"Paris, 338.591 meters; Lyon, 4.400; Marseille, 6.263 meters; total, France, 217 miles 35 yards."

Very truly, yours,

JOHN M. CARSON,
Chief of Bureau.

Hon. JOSEPH STEWART,
Second Assistant Postmaster-General.

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF MANUFACTURES,
Washington, December 4, 1908.

DEAR SIR: Referring to previous correspondence in regard to mileage of pneumatic tubes in France, I respectfully inform you that advices received by mail from the American consul-general at Paris explain the figures contained in his cablegram and furnishes details that may be of service to you. The consul-general, quoting the figures of his cablegram heretofore transmitted, states:

"These are the statistics which have been furnished to this consulate upon direct personal application to the ministry of posts and telegraphs at Paris and are presumably correct, although the total lengths of tubes reported as in use at Lyon and Marseille differ slightly from the figures which have been telegraphed to me by the consuls in those cities. At Lyon and Marseille the pneumatic tubes are used simply to connect the central post and telegraph bureau with branch offices, whereas at Paris the system covers the area of the entire postal service within the walls. There appears to be no pneumatic-tube system in use at Havre, Bordeaux, or any other French city, except the three above designated."

Very truly, yours,

JOHN M. CARSON,
Chief of Bureau.

Hon. JOSEPH STEWART,
Second Assistant Postmaster-General.

PNEUMATIC-TUBE SYSTEM IN PARIS.

The postal administration at Paris submitted a catalogue describing the kind and dimensions of material, with prices therefor and the cost of installation of such materials, all in very great detail. The length of this list and the difficulty of literally translating it have resulted in its omission; the essential features, however, are embodied in the information given above relating to the system, the total cost of installation, and the yearly cost of operation.

○